Vol. 1044 Number 5

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

July 31, 1984

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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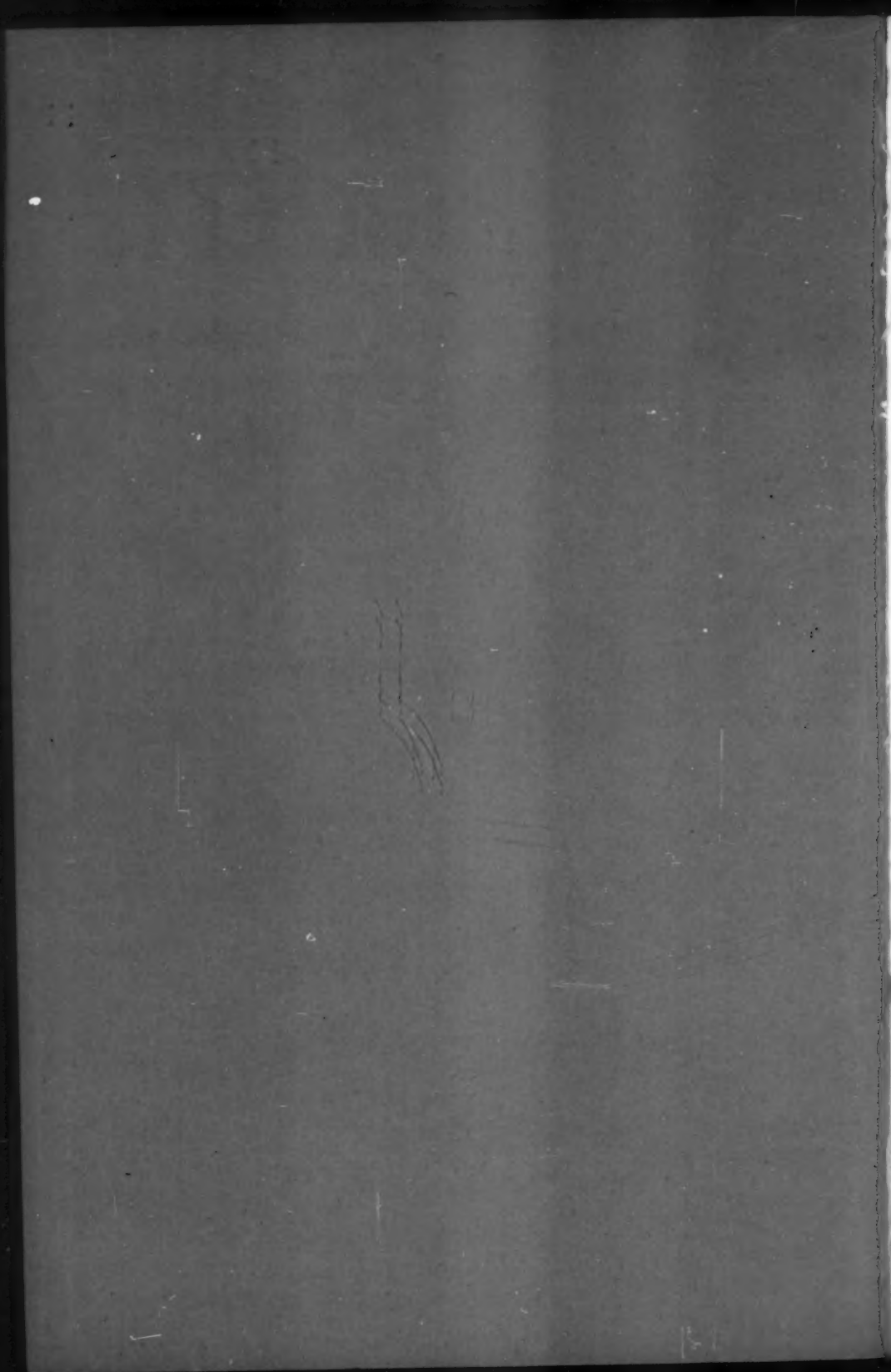
Office



OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

July 31, 1984 Volume 1044 Number 5

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AUG 29 1984

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Apr. 13, 1984. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of June 1984

Affirmed	179
Affirmed in Part	22
Reversed	77
Total	278

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,324,568, Re. S.N. 598,984, Filed Apr. 11, 1984, Cl. 55/97, METHOD AND APPARATUS FOR THE LEAK TESTING OF FILTERS, David E. Wilcox, et al., Owner of Record: *Flanders Filters, Inc., Washington, N.C.,* Attorney or Agent: Charles B. Elderkin, Ex. Gp.: 135

4,380,441, Re. S.N. 577,524, Filed Feb. 6, 1984, Cl. 441/112, FLOTATION VEST, Robert G. Harr, et al., Owner of Record: *America's Cup, Inc., City Industry, Calif.,* Attorney or Agent: Louis J. Knobbe, et al., Ex. Gp.: 315

4,400,780, Re. S.N. 600,269, Filed Apr. 12, 1984, Cl. 364/449, MOVING BODY TRUCK INDICATOR SYSTEM, Syuji Nagao, et al., Owner of Record: *Furuno Electric Co. Ltd., Nagasaki, Japan,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 237

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,952,112, Reexam. No. 90/000,577, Requested: June 15, 1984, Cl. 426/321, METHOD FOR TREATING DRIED FRUITS TO IMPROVE SOFTNESS RETENTION CHARACTERISTICS, Charles V. Fulger, et al., Owner of Record: *Kellogg Co., Battlecreek, Mich.,* Attorney or Agent: Gary & Juettner, Ex. Gp.: 130, Requester: Quaker Oats Co., Chicago, Ill.

3,987,467, Reexam. No. 90/000,571, Requested: June 8, 1984, Cl. 354/105, PHOTOGRAPHIC FILM IDENTIFICATION SYSTEM, David W. Cowles, Owner of Record: *Shastar Corp., Las Vegas, Nev.,* Attorney or Agent: Spensley, Horn, et al., Ex. Gp.: 210, Requester: Dowrey & Cross, Seattle, Wash.

4,339,268, Reexam. No. 90/000,575, Requested: June 14, 1984, Cl. 71/108, HERBICIDAL NITROALKYL 4-[2-CHLORO-4-(TRIFLUOROMETHYL)-PHENOXY]-2- NITROBENZOATES, Robert J. Theissen, Owner of Record: *Rhone-Poulenc Agrochimie, Lyon, France,* Attorney or Agent: Morgan, Finnegan, et al., Ex. Gp.: 120, Requester: Terence P. Strobaugh, Philadelphia, Pa.

4,374,798, Reexam. No. 90/000,581, Requested: June 27, 1984, Cl. 264/288.8, PLASTICS MATERIAL MESH STRUCTURE, Frank B. Mercer, Owner of Record: *P. L. G. Research Ltd., Blackburn, Lancashire, England,* Attorney or Agent: Holman & Stern, Ex. Gp.: 130, Requester: Owner

4,439,475, Reexam. No. 90/000,582, Requested: June 27, 1984, Cl. 428/98, NAP MAT OR CARPET OF WASHABLE TYPE HAVING INCREASED LIQUID REMOVAL THERE FROM DURING WASHING THEREOF, Aage Lang, Owner of Record: *Clean-Tex A/S, DK-8544 Morke, Denmark,* Attorney or Agent: Earle R. Marden, Ex. Gp.: 156, Requester: Earle R. Marden, Spartanburg, S.C.

Erratum

"All reference to Patent No. 4,458,443 to Gordon A. Barlow, et al., of Ill. for 'MAGNETIC TOY' appearing in the Official Gazette of July 10, 1984, should be deleted since no patent was granted."

US Govt. Depository
No. Dartmouth, Ma.

Status of PTO Services

The following is an update of the status of PTO services for June 1984:

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual	Comment
Filing Receipts:			
Patents	22	22	
Trademarks	30	71	Delay due to machine failure. Actual to be 30 days by end of July.
Patent/Trademark Copies:			
Window Coupons	5	99% within 5 days	
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		June 25, 1984	
Certified Copies:			
Trademark Registrations	30	18	
Applications-As-Filed	20	99% within 15 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	28	
Filing Reg. Certificates	3	4	
Assignments:			
Patents	25	20	
Trademarks	25	15	
Avg. Days from Issue Fee Payment to Issue Date	90-100	87	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	Avg. 1 day late	
Patent Copies Available	Issue Date	Avg. 2 days late	
Trademark Copies Available	Issue Date	On schedule	
Trademark Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 2 days late	
Trademark Regs. Mailed	Issue Date	Issue Date	

*Figures include mail processing and delivery time.

IMPROVEMENTS TO SERVICES

- *Public Newsline*—On June 13, 1984, as a service to the public, we placed an electronic bulletin board in the Patent Public Search Room. Through the use of a video terminal, members of the public may obtain current information under the following headings:
  1. Public Information Contacts and Services
  2. Locations of Patents by Classification
  3. Automated Search Room Tools
  4. Status of PTO Services
  5. News Items
  6. Public Suggestions.
- *Patent and Trademark Copy Sales*—our new contractor, Vanguard Technologies, has completed the transition phase of contractor startup. The public service window is now providing the following services:
  SPECIAL ORDERS for those patents/trademarks available in preprinted stock (approximately the most recent 18 months) will be filled in one day. This special service will cost $2.00 per copy.
  COUPONS will be returned with all copy requests.
- *Trademark Search Room*—During June, the following working environment improvements were accomplished:
  - —all burned-out lights were replaced and glass panels cleaned for improved illumination;
  - —all damaged or severely stained ceiling tiles were replaced;
  - —daily carpet vacuuming was ordered; and
  - —missing heating/air conditioning air registers were replaced and units cleaned.

HELPFUL HINTS FROM THE PTO

- *Data To Be Included On Patent and Trademark Papers Filed In The PTO In Response To Office Actions*—Perhaps the greatest cause of delay and wasted time in the support sections of the PTO is in trying to match papers bearing incorrect or incomplete data with applications. Because some Trademark Papers are not clearly identified as pertaining to Trademark applications, they are frequently misrouted to the Patent Examining Groups.

On all papers related to *Patent* applications, type the word "PATENT" in the upper right-hand corner of the document. Also, please include the correct serial number, filing date, inventor's name, and title of the invention. Additionally, include the examiner's name, and group art unit number or other identifying data found on the most recent letter from the PTO. (37 CFR 1.1(a)).

However, please note that an organizational restructuring of the Patent Examining Corps has resulted in many applications being reassigned to new Groups and Art Units. Your attention is directed to the NOTICE OF CHANGES IN THE PATENT EXAMINING CORPS that appeared in the OFFICIAL GAZETTE on June 26, 1984, (1043 OG 23), which identifies the Group Art Unit of each examiner (1043 OG 40 through 1043 OG 67). Letters mailed from the Groups after April 15, 1984, should reflect the current identifying data.

For all papers related to *Trademark* applications, type the word "TRADEMARK" in the upper right-hand corner of the document. Also, please set forth the applicant's name, correct serial number (including the series number which currently is "73"), filing date, law office, examining attorney and mark.

Documents for which no fee is required at the time of filing (e.g., amendments to applications and requests for extensions of time to file an opposition) continue to be addressed:

Box 5
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Mail directed to the Trademark Trial and Appeal Board should have mark "Attention: TTAB" on the envelope in addition to "Box 5."

- *Mailing Responses To The PTO*—In general, it would eliminate or greatly reduce processing steps by the PTO support staff, and will avoid interruption of the examiner's work, if a few simple, general rules were followed in regard to mailing of the responses to the PTO.

1. After a Patent or Trademark application is filed, please avoid filing additional papers (other than those requesting a filing receipt or those required by the Office) until the filing receipt or return post card identifying the Serial Number and Patent Examining Group Art Unit or Trademark Law Office has been received.
2. In *Patent* applications, requests for extensions of time, changes of address, proposed drawing corrections, and petitions are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response." In *Trademark* applications, change of address and powers of attorney are sometimes incorporated in the remarks section or at the beginning of papers entitled "Amendment" or "Response". Please present such items in separate papers, appropriately titled, since they are all handled by different personnel (37 CFR 1.4(c)). However, please include a statement in the amendment/response describing the paper being filed.
3. Where a supplemental or preliminary amendment is found necessary in *Patent* or *Trademark* applications, please telephone the examiner and request that the examiner delay action for a certain time in order to avoid crossing in the mails of the amendment and the Office action.
4. File *Patent* and *Trademark* documents which have no particular time or sequence requirement, with materials submitted in response to the statutory or regulatory requirements. Examples are certified copies of foreign documents to support priority and formal drawings in Patent applications or changes in Power of Attorney or Mailing Address following first action.
5. If a disclosure statement is to be filed before an Office action, file it when the application is filed. Some Group Art Units have greatly reduced the pendency to first action. Hence, many examiners are taking up new applications before an information statement is matched with the application.

July 10, 1984.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of July 31, 1984

B. 13,553,638	4,389,732	4,419,182	4,430,761
B. 13,558,040	4,390,685	4,419,287	4,430,877
B. 14,208,965	4,390,965	4,419,753	4,430,963
Re. 31,368	4,391,357	4,419,850	4,431,494
Re. 31,508	4,392,123	4,419,907	4,431,743
D. 266,210	4,392,397	4,420,067	4,432,419
4,067,779	4,393,428	4,420,191	4,432,464
4,167,092	4,395,288	4,421,419	4,432,623
4,181,665	4,398,419	4,422,156	4,432,885
4,198,430	4,399,288	4,422,496	4,433,062
4,222,267	4,400,461	4,422,591	4,433,067
4,259,428	4,400,584	4,422,628	4,434,138
4,293,688	4,401,667	4,422,814	4,434,287
4,324,256	4,405,025	4,424,394	4,434,698
4,346,512	4,408,960	4,426,159	4,435,600
4,350,196	4,409,241	4,426,407	4,435,896
4,358,258	4,409,318	4,426,439	4,436,438
4,361,839	4,410,216	4,426,954	4,436,497
4,363,774	4,410,498	4,427,110	4,436,527
4,365,290	4,413,045	4,427,164	4,436,530
4,366,072	4,413,989	4,428,161	4,438,017
4,366,469	4,414,642	4,428,483	4,440,343
4,368,573	4,415,611	4,428,863	4,440,709
4,370,925	4,415,615	4,429,029	4,440,866
4,380,468	4,417,246	4,429,397	4,441,683
4,385,985	4,417,622	4,430,206	4,443,080
4,387,180	4,417,883	4,430,211	4,453,212
4,387,293	4,418,198	4,430,287	4,454,508
4,388,469	4,418,507	4,430,364	

Disclaimers

3,953,673.—*Richard M. Dorward,* Coventry, England, DIGITAL DATA SIGNALLING SYSTEMS AND APPARATUS THEREFOR. Patent dated Apr. 27, 1976. Disclaimer filed Sept. 19, 1983, by the assignee, *The General Electric Co., p. l. c.*

Hereby enters this disclaimer to claims 1, 2, 4, 9 and 10 of said patent.

4,259,014.—*Yair Talmi,* Plainsboro, N.J. FIBER OPTIC POLYCHROMATOR. Patent dated Mar. 31, 1981. Disclaimer filed June 7, 1984, by the assignee, *Baylor University.*

Hereby enters this disclaimer to all claims of said patent.

4,427,291.—*Pierce B. Day,* Pittsford, N.Y. COMPACT OPTICAL IMAGING APPARATUS. Patent dated Jan. 24, 1984. Disclaimer filed Apr. 26, 1984, by the assignee, *Eastman Kodak Co.*

Hereby enters this disclaimer to claims 1–6 of said patent.

Dedication

4,386,011.—*Lawrence M. Fodor,* Bartlesville, Okla. OLEFIN POLYMERIZATION WITH CATALYSTS CONTAINING FOOD GRADE ADDITIVES. Patent dated May 31, 1983. Dedication filed May 29, 1984, by the assignee, *Phillips Petroleum Co.*

Hereby dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
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	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 23, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-21-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	6-24-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	6-30-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-25-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-29-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-29-81
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	3-29-82
DESIGN, GROUP 290—K. L. CAGE, Director	3-12-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	9-14-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-29-81

Expiration of patents: The patents within the range of numbers indicated below expire during June 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,323,134 to 3,328,805, inclusive

Plant Patents . . . . . Numbers 2,766 to 2,749 inclusive

REISSUES

JULY 31, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,636

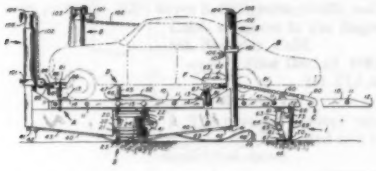
AUTO BODY AND FRAME STRAIGHTENING DEVICE

Finis L. Chisum, Box 1145, Claremore, Okla.

Original No. 3,888,100, dated Jun. 10, 1975, Ser. No. 211,527, Dec. 23, 1971. Continuation-in-part of Ser. No. 810,940, Mar. 27, 1969, Pat. No. 3,630,066. Application for reissue Aug. 30, 1976, Ser. No. 718,601

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—305 **16 Claims**



1. Apparatus for applying equal and opposite forces to a mechanical structure such as an automotive vehicle body or frame comprising:

a. a platform system;

b. means on said platform system for supporting said structure;

c. at least one vertical pull tower means pivotally connected about a vertical axis fixed to said platform system rotatably moveable to a desired position relative to said structure;

d. means to vertically elongate said tower;

e. means to connect a tension member between said vertically elongate means and a first portion of said structure to apply a first force to said structure; and

f. means to apply a second force between a second portion of said structure and said platform system.

Re. 31,637

COMBINATION MICROWAVE AND GAS OVEN

Nagatoshi Yoshida, Moriguchi, and Yoshihito Taga, Tottori, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Original No. 4,211,909, dated Jul. 8, 1980, Ser. No. 906,245, May 15, 1978. Application for reissue Sep. 10, 1982, Ser. No. 416,510

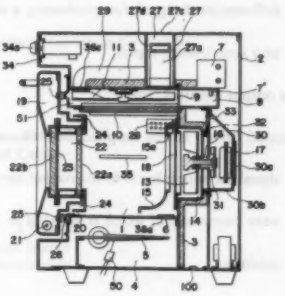
Claims priority, application Japan, May 13, 1977, 52-56213

Int. Cl.³ H05B *6/64*

U.S. Cl. 219—10.55 R **18 Claims**

1. A combination microwave and gas oven which comprises:

an outer casing, a heating cavity defined by walls within said outer casing, means for supplying microwave energy into said heating cavity, a combustion chamber positioned adjacent to said heating cavity within said outer casing, a door means adapted to selectively open and close an opening defined at one side of said heating cavity, a gas burner positioned within said combustion chamber for supplying heated air to said heating cavity, a circulation fan positioned within a housing and communicating with said heating cavity for circulating said heated air inside said heating cavity, first microwave screen means, positioned within said outer casing on the side thereof opposite said door means for preventing the leakage of microwave energy from said heating cavity through said housing, an exhaust passage positioned between said heating cavity and said outer casing, for allowing said heated air to flow out of said outer casing, and seal means interposed between said door means and a periphery of said opening of said heating cavity for preventing the leakage of microwave energy and heated air from inside of said heating



cavity to outside of said heating cavity through the space between said door means and the periphery of said opening.

Re. 31,638

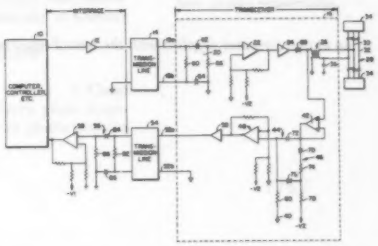
WIDEBAND TRANSCEIVER WITH EMI SUPPRESSION

Tat C. Lam, Fremont, Calif., assignor to TCL, Inc., Santa Clara, Calif.

Original No. 4,317,205, dated Feb. 23, 1982, Ser. No. 159,364, Jun. 13, 1980. Application for reissue Apr. 26, 1982, Ser. No. 371,605

Int. Cl.³ H04B *1/38*

U.S. Cl. 375—7 **8 Claims**



1. A data communication transceiver for transmitting signals to a communicating medium and receiving signals therefrom which are generated by another transceiver, the transceiver comprising

an input terminal,

first, short time constant differentiation means connected to the input terminal to differentiate signals applied thereto and produce a first differentiated output signal,

Schmitt trigger means supplied with the differentiated output signal for producing a corresponding [first square wave output signal,

first driver means supplied with the square wave output for supplying it to the communicating medium,

amplifying means for receiving signals from the communicating medium and for producing an amplified output therefrom,

second short time constant differentiation means supplied

with the amplified output signal for differentiating it and for producing a second differentiated signal,

second Schmitt trigger means supplied with the second differentiated signal for producing a corresponding second squarewave signal,

an output terminal, and

second driver means supplied with the second squarewave signal for supplying it to the output terminal.] *first square wave output signal which is supplied to the communicating medium,*

receiving means for receiving signals from the communicating medium and for producing an output therefrom,

second differentiation means supplied with the output signal from the receiving means for differentiating it and for producing a second differentiated signal,

second Schmitt trigger means supplied with the second differerntiated signal for producing a corresponding second squarewave signal, and

an output terminal supplied with the second squarewave signal.

Re. 31,639

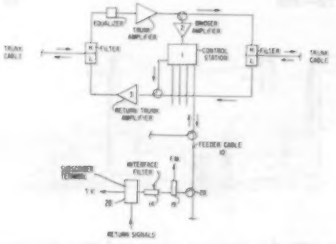
BIDIRECTIONAL UNICABLE SWITCHING SYSTEM

Victor Nicholson, 4701 Willard Ave., #1033, Chevy Chase, Md. 20015

Original No. 4,077,006, dated Feb. 28, 1978, Ser. No. 672,066, Mar. 30, 1976. Continuation of Ser. No. 116,192, Jan. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 558,425, Mar. 14, 1975, abandoned, which is a continuation of Ser. No. 405,846, Oct. 12, 1973, abandoned. Application for reissue Nov. 16, 1981, Ser. No. 321,999

Int. Cl.³ H04B *1/06*; H04N *1/00*

U.S. Cl. 455—4 **16 Claims**



7. In a cable distribution system having a head end, means at said head end for receiving multiple channels, a coaxial cable having multiple channel capacity connected to said head end, a bridger amplifier connected to the coaxial cable for receiving and amplifying signals in the multiple channels, a control station connected to the bridger amplifier, said control station including a switching network and channel converters connected to the bridger amplifier, a feeder cable having a plurality of subscriber allocated channels, said feeder cable connected to the switching network and channel converters, a plurality of subscriber drops connected to the feeder cable, each subscriber drop being connected to a single subscriber allocated channel in the feeder cable, thereby allocating one channel in the feeder cable to each subscriber drop, means at each subscriber drop for sending a control signal to the control station on the subscriber allocated channel allocated to that subscriber drop to control the switching network at the control station.

PLANT PATENTS

GRANTED JULY 31, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,264

STRAWBERRY PLANT 'SOQUEL'

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 23, 1982, Ser. No. 452,694

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above.

5,265

STRAWBERRY PLANT 'TUSTIN'

Victor Voth, Santa Ana, and Royce S. Bringhurst, Davis, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 23, 1982, Ser. No. 452,695

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above.

5,266

STRAWBERRY PLANT 'SELVA'

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 23, 1982, Ser. No. 452,696

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above.

PATENTS

GRANTED JUL. 31, 1984

ERRATA

For CLASS	See PATENT NO.
403–329	4,462,142
194–001	4,462,512
194–100	4,462,513
198–334	4,462,514
198–426	4,462,515
198–427	4,462,516
198–451	4,462,517
198–479	4,462,518
198–490	4,462,519
198–525	4,462,520
198–621	4,462,521
198–766	4,462,522
198–810	4,462,523
198–845	4,462,524
277–235	4,462,615
346–210	4,462,616
310–198	4,462,859
075–229	4,463,058
568–016	4,463,202
562–462	4,463,208

PATENTS

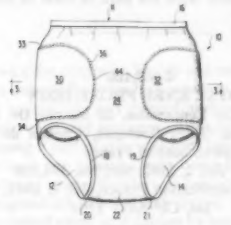
GRANTED JULY 31, 1984

GENERAL AND MECHANICAL

4,462,115
WOMAN'S PROTECTIVE UNDERGARMENT FOR VOLLEYBALL

Linda A. Carlson, North Platte, and Steven R. Morgan, Ogallala, both of Nebr., assignors to Volleyball World, Inc., Ogallala, Nebr.

Filed Apr. 24, 1981, Ser. No. 257,111
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **4 Claims**



1. Woman's volleyball protective garment, capable of being worn under gym shorts, which provides for freedom of movement of the wearer without bulkiness and without blocking hygienic access of air for ventilation and evaporation of perspiration in the crotch and adjacent areas, comprising

a panty-type brief for covering the lower midsection including the side, frontal, and posterior hip area from the waist downwardly extending to a portion of the upper thighs of the wearer,

such brief including a waist opening at its upper periphery, leg openings at its lower periphery, a crotch front and rear risers extending from the crotch to the waist opening, and side hip-covering portions extending from the waist to upper thigh portions of the wearer,

such brief comprising a fabric with porous characteristics for access of air and evaporation of perspiration, and

shock-absorbing protective pads of extended surface area integral with such fabric,

such pads

comprising a resilient foam in sheet form having a thickness from about 3/16" to about 5/16", such resilient foam pads being covered on their surface for contacting the body of a wearer with a non-abrasive fabric,

located internally of the panty-type brief,

extending over each hip side portion from a location contiguous to the waist opening to the leg opening,

extending into the front riser to a location above the leg openings at their inner edges so as to cover the iliac crest area of the wearer, and

extending into the rear riser to cover the posterior superior iliac spine area of the wearer, with

the crotch and remaining areas of the front and rear risers above the crotch being free of protective pad covering.

4,462,116
ATHLETIC SWEATBAND

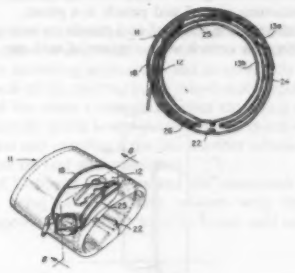
Salvatore J. Sanzone, Cedarhurst, and Donald Krout, New York, both of N.Y., assignors to Sankro Sportsline Products, Inc., Brooklyn, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,645
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—170 **33 Claims**

1. An athletic sweatband comprising:

a continuous band of material disposable about a portion of the body of the user,

said band having an interior compartment communicable with the exterior of said band through an opening in said band, and



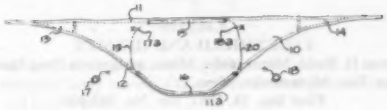
an article container disposable in said band compartment having at least one opening communicable with said band opening,

said article container being insertable and removable from said compartment.

4,462,117
DRAPABLE HEAD COVERING

Beatrice Y. Brunelle, 74-000 Shadow Mt. Dr., Palm Desert, Calif. 92260

Filed Jul. 13, 1983, Ser. No. 513,459
Int. Cl.³ A42B *1/04*
U.S. Cl. 2—202 **9 Claims**



1. A head covering comprising a generally triangular shaped piece of flexible fabric material having a base length substantially greater than the height thus providing an enlarged central area and elongated ends, a crown portion defined by a strip of elasticized material coupled to the fabric material and which in the relaxed state forms a head enclosing area within the central area of the triangular piece, and a pair of loops each of which is attached to the fabric at a point between the crown portion and the elongated end adapted to receive said ends therethrough.

4,462,118
METHOD OF MAKING A FLAT PLANE SEAM GARMENT

Philip N. Bowditch, Cohasset, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jun. 1, 1983, Ser. No. 500,003
Int. Cl.³ A41D *00/00*
U.S. Cl. 2—243 R **1 Claim**

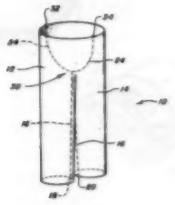
1. A method for assembling pants from two substantially identical fabric panels using flat plane seams for joining said two panels, said pants having a continuous flat plane inseam intersecting with a continuous flat plane crotch seam at a saddle region, said inseam extending from the lowermost por-

tion of one of the legs of said pants to the lowermost portion of the other of the legs of said pants, and said crotch seam extending between two points on the top of said pants,
wherein each of said fabric panels includes an upper portion and a leg portion and includes on one side an inseam region and a crotch seam region contiguous thereto and on the opposite side a similar inseam region and crotch seam region contiguous thereto, said crotch seam regions defining said upper portions of said panels and said inseam regions defining a leg portions of said panels, including the sequential steps of:

A. positioning one of said panels in a plane,

B. overlaying the other of said panels on said one panel,

C. joining the crotch seam regions of said one panel to the



corresponding overlaying crotch seam regions of said other panel to form two flat plane segments of said crotch seam,

D. folding the leg portion of one of said panels 180 degrees about a first fold axis passing through the junction points of said contiguous inseam region and crotch region of said panel,

E. folding said panels 180 degrees about a second fold axis passing between said one side and said other side whereby said inseam regions of each panel are mutually adjacent, in a flat plane

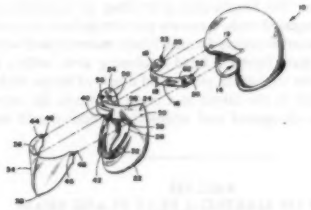
F. joining said adjacent inseam regions thereby forming said flat plane inseam and joining said two segments to form said flat plane crotch seam.

4,462,119

FACE SHIELD AND HELMET

Thomas H. Rudd, Minneapolis, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.

Filed Sep. 18, 1981, Ser. No. 303,406
Int. Cl.³ A61F *9/04*; A42B *3/00*
U.S. Cl. 2—424 **7 Claims**



1. A face shield for a helmet comprising:

a. a body member for attachment to a helmet, at least a portion of said body member being transparent to allow vision when interposed in the path of view of the wearer;

b. at least one coupling band for pivotally attaching said body member to said helmet;

c. at least one detent groove attached to said coupling band wherein said detent groove is comprised of at least one ramp surface upwardly inclined from the surface of said coupling band, at least one slide surface located adjacent to said ramp surface and extending downwardly from said ramp surface, and at least one rectangular projection on said coupling band having one vertical side adjacent to said slide surface thereby forming said detent groove between said slide surface and said vertical side of said rectangular projection; and

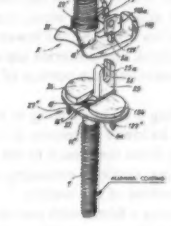
d. at least one protrusion attached to said body member at a location adjacent to and engaging said detent groove for automatically restraining said pivotally attached body member when in the path of view of said wearer and for automatically releasing said body member from said restrained position when a predetermined pressure is applied thereto, thereby enabling said body member to be pivotally moved away from the path of view of said wearer.

4,462,120

TOTAL KNEE PROSTHESIS

André Rambert, Les Fontanelles, 10 bis rue Dr. Bonhomme, 69003 Lyon, and Gilles Bousquet, Chemin de Marandon, Saint-Etienne (Loire), both of France

Filed Jul. 2, 1982, Ser. No. 394,508
Claims priority, application France, Jul. 6, 1981, 81 13723
Int. Cl.³ A61F *1/04*
U.S. Cl. 3—1.911 **10 Claims**



1. In a knee prosthesis comprising a lower support member with a platform bisected by a transverse midplane, said platform being provided with two lower contact surfaces on opposite sides of said midplane, an upper support member having a pair of rearwardly diverging condylar prongs with undersides merging forwardly into a pair of downwardly convex upper contact surfaces positioned to roll on said lower contact surfaces, a lug rising from said platform in said midplane and projecting between said upper contact surfaces, a transverse pin on said upper support member received in a slot of said lug, a first shank rising from said upper support member for insertion into the medullary canal of a patient's femur, and a second shank descending from said lower support member with an axis in said midplane for insertion into the medullary canal of the patient's tibia,

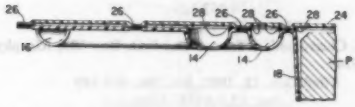
the improvement wherein said first and second shanks are externally threaded and are respectively provided with first and second fastening means for detachably securing same to said upper and lower support members, said first fastening means lying forwardly of said prongs, said lug being disposed rearwardly of said second fastening means with a beveled slot, enabling limited relative horizontal twisting of said support members, extending parallel to the axis of said second shank at a location set back from a line of engagement of said upper contact surfaces with said lower contact surfaces in a position of approximate alignment of said shanks with each other.

4,462,121

PASSAGEWAY RESISTANT TO CAPILLARY TRANSPORT

Robert S. Dirksing, and Bruce A. Yeazell, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 19, 1982, Ser. No. 360,104
Int. Cl.³ E03D *9/03*
U.S. Cl. 4—228 **4 Claims**



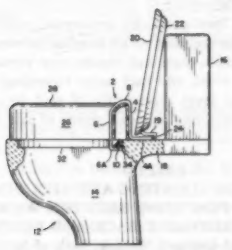
1. In a device for confining liquids and including an interior reservoir, an outwardly extending capillary transport resistant passageway having one end thereof in direct communication with said reservoir, said passageway having a circumscribing wall comprising a pair of sheets of heat sealable thermoplastic material, at least one of said sheets being formed with a passageway-defining recess therein and having a heat seal flange on each longitudinal side of said recess, said thermoplastic sheets being united along said flanges by longitudinally extending joints on each side of the passageway, said joints comprising an outer fin-type heat sealed section having a capillary channel immediately adjacent thereto and an inner fillet section which isolates the heat sealed section from the passageway, said fillet section being made of a material in intimate contact with said wall along the portions thereof contiguous the inner edge of the heat sealed section and filling the capillary channel longitudinally along said passageway, said material having properties which prevent its displacement by the liquid to be placed in said device.

4,462,122

RAISED SUPERIMPOSED TOILET SEAT AND SECURING CLAMP

John Broeils, Wycoff, N.J., assignor to Maddak, Inc., Pequannock, N.J.

Filed Nov. 23, 1983, Ser. No. 554,785
Int. Cl.³ A47K *13/00*
U.S. Cl. 4—239 **14 Claims**



1. For use with a toilet of the type having a bowl, a water tank, a section connecting the bowl to the tank, a seat and a lid, means coupling the seat and lid to the connecting section so that the seat and lid can be lifted relative to the bowl, with a space being provided between the coupling means and the connecting section when said seat and lid are lifted to rest against the tank, in combination, a raised seat superimposed on the toilet and a clamp for securing said raised superimposed seat to the toilet, characterized by:

the raised seat including an upper portion which rests on the bowl, a lower portion which fits into the bowl and having a recess on the underside thereof; and an opening extending through the upper and lower portions;

the clamp including a pair of substantially L-shaped members in spaced relation and joined by a contoured member for providing an integral clamp;

the base of one of the substantially L-shaped members being received in the space between the coupling means and the connecting section so as to be captured therein, with said one L-shaped member extending adjacent to and upwardly external to the back of the raised superimposed seat;

the contoured member extending adjacent to and around the upper portion of said back, with the other of the L-shaped members extending adjacent to and downwardly internal to the back of the opening in the raised superimposed seat;

the base of the other L-shaped member extending adjacent the underside of the lower portion of the raised superimposed seat and carrying a pin-like member which engages the recess on said underside; and

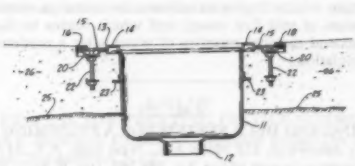
the pair of L-shaped members and the contoured member thereby being in cooperative relation with the raised superimposed seat and the toilet to secure said seat to the toilet.

4,462,123

FABRICATED FLOOR DRAIN WITH LARGE STEPPED FLANGE FOR ELASTOMERIC TROWELLED COVERING

Earl L. Morris, La Habra Heights, and V. Walter Hafner, Whittier, both of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Sep. 29, 1982, Ser. No. 428,404
Int. Cl.³ E03C *1/26*
U.S. Cl. 4—286 **10 Claims**



1. A floor drain for waste reception comprising:

a receptor body having a bottom outlet and generally vertical side walls;

a top rim affixed to the top of the receptor body;

a large top flange affixed to the top rim of the receptor body, said top flange having a generally planar surface; and

a removable screed guide affixed to the upper surface of the large top flange near the outer edges thereof, said screed guide comprising at least one length of flexible tape with a delayed tack adhesive on the underside thereof to facilitate the removal of the tape from the flange.

4,462,124

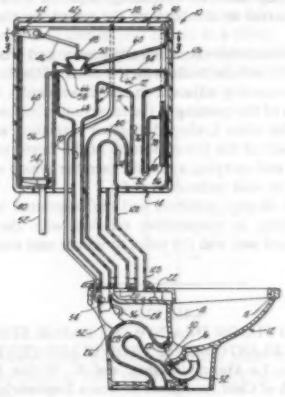
FLUSH APPARATUS FOR WATER CLOSET AND METHOD OF OPERATION

John M. Antos, Ann Arbor; Richard G. Lapham, Jackson; Charles L. Sargent, Ann Arbor, all of Mich., and Frank T. Sargent, Ft. Myers, Fla., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Feb. 9, 1981, Ser. No. 232,651
Int. Cl.³ E03D *5/00*
U.S. Cl. 4—346 **11 Claims**

1. A water closet comprising a bowl with an outlet in the bottom thereof, a trapway connected to the outlet of said bowl so as to provide a weirlevel at an elevation sufficient to maintain a selected water level in said bowl, a siphon jet arranged to discharge water into said trapway adjacent to said bowl outlet to initiate siphoning of water from said bowl, and flush appara-

tus for discharging flush water to said bowl and to said siphon jet, characterized in that said flush apparatus includes first means to measure and discharge initially a first metered quantity of water through said siphon jet sufficient to initiate siphoning of water and waste contents from said bowl, and second means to discharge a second metered quantity of water to said bowl for rinsing the bowl, said second means being reponsive to operation of said first means to discharge the



second metered quantity of water to the bowl in timed-delay relation so that the major portion of the water and waste contents have been siphoned from said bowl when the rinse water flows into the bowl, said second means comprising chamber structure which begins to accumulate water in response to operation of said first means and which begins to discharge said second metered quantity of water after a predetermined accumulation.

4,462,125

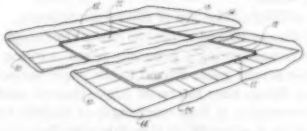
COPING AND DECK SYSTEM FOR A SWIMMING POOL

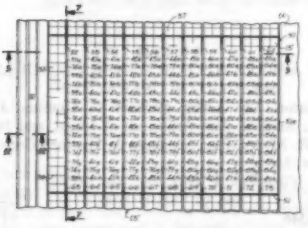
Henry Jakowicki, 123 Malts Ave., West Islip, N.Y. 11795

Continuation-in-part of Ser. No. 859,253, Dec. 9, 1977, Pat. No. 4,249,273. This application Jun. 20, 1980, Ser. No. 161,366

Int. Cl.³ E04H *3/18*

U.S. Cl. 4—507 **33 Claims**





1. Collection apparatus for water from a swimming pool having a bounding side wall, said apparatus comprising an overflow member at the side wall of the pool for flow of pool water thereover, and flow receiving means extending outwardly from the overflow member for receiving overflow water therefrom, said flow receiving means comprising a hollow member including upper and lower flanges and a longitudinal channel between said flanges, said upper flange having openings therein for passage of water through said upper flange into said channel, a surge tank at a level below said channel, and means providing communication between said channel and said surge tank for flow of water from said channel to said surge tank.

4,462,126

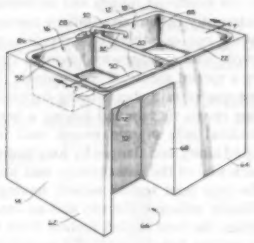
SINK FOR SEATED USER

Mildred S. Cleaveland, 6 Tanner Ct., P.O. Box 689, Murphys, Calif. 95247

Filed Dec. 13, 1982, Ser. No. 449,549

Int. Cl.³ A47K *1/04*

U.S. Cl. 4—619 **14 Claims**



1. A sink for a seated user, comprising:

at least one basin including bottom wall means and perimetrical upstanding sidewall means including a front, a back and two laterally opposite sides;

means providing a drain opening through said bottom wall means;

wall means providing a ledge of substantial height extending between said two laterally opposite sides of said upstanding sidewall means and upper and lower margins;

said bottom wall means being provided in at least two generally horizontal portions including a rear portion disposed at a first, lower level, including said drain opening and joining the lower margin of said ledge, and a front portion disposed at a second, higher level and joining the upper margin of said ledge;

said sink being at least generally correspondingly frontally and downwardly recessed as an external consequence of the provision said bottom wall means front portion at said second, higher level, and said ledge extending down to said first, lower level rearwardly of said front of said perimetrical upstanding sidewall means of said basin.

4,462,127

APPARATUS FOR LOCATING AND SECURING AN OBJECT AT END POSITIONS BETWEEN WHICH THE OBJECT IS MOVABLE BACK AND FORTH

Werner Schmidt, and Gerhard Watzek, both of Munich, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg, Munich, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,744

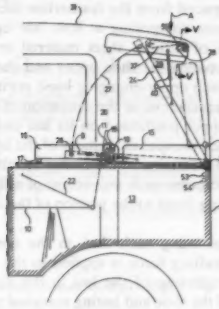
Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118337

Int. Cl.³ A47C *19/16*

U.S. Cl. 5—118 **9 Claims**

1. In apparatus for the movement of an object back and forth between first and second end positions comprising fittings at least at one of said end positions located on opposite sides of said object, said object having latching pins mounted on opposite sides thereof, said fittings having latching holes adapted for receiving the latching pins mounted on the object and spring

means resiliently urging the latching pins to a position for engaging in the latching holes, the improvement wherein said fittings have inclined guide surfaces facing one another defining a converging space in the direction of entry of said object, guide means on said object slidably receiving each pin, said guide surfaces being positioned to guide said guide means and



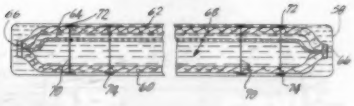
act upon the respective associated pins to displace said pins against the action of the spring means until the pins reach the latching holes and engage thereinto, each said guide means comprising a guide nut around each pin, said guide nut having a guide surface for riding on the inclined guide surface on the respective fittings.

4,462,128

WAVE-REDUCING BAFFLE FOR WATER BEDS

Richard A. LaBianco, 1870 Port Charles, Newport Beach, Calif. 92660

Filed Jan. 9, 1981, Ser. No. 223,699
Int. Cl.³ A47C *27/08*
U.S. Cl. 5—450 **12 Claims**



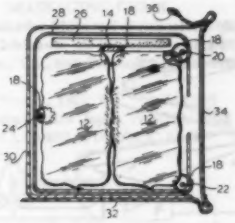
1. A wave-reducing water bed mattress comprising:
a mattress having a hollow interior for containing a body of water;
a wave reduction baffle within the hollow interior of the mattress, the baffle comprising at least one flexible fibrous layer, and float means located below the fibrous layer for applying buoyant forces to said fibrous layer for causing the fibrous layer to float next to the upper surface of the mattress; and
anchoring means comprising an additional fibrous layer spaced below the floating fibrous layer for forming a chamber, in which water is contained between the floating fibrous layer and the additional fibrous layer so that entry or exit of water into and out of the chamber is permitted only through the fibrous layers, and in which the additional fibrous layer rests on but is detached from the lower wall surface of the mattress when the mattress is filled with water, the additional fibrous layer being secured to the floating fibrous layer for restraining movement of the floating fibrous layer within the interior of the mattress.

4,462,129

STABILIZED MATTRESS BORDER

Paul H. Brannock, Lilburn, Ga., assignor to Simmons U.S.A., Atlanta, Ga.

Filed Feb. 17, 1983, Ser. No. 467,543
Int. Cl.³ A47C *23/053*
U.S. Cl. 5—474 **8 Claims**



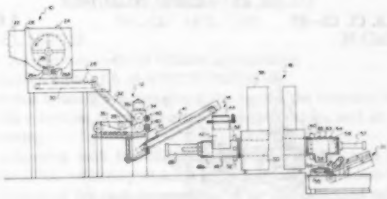
1. A border assembly for a mattress or the like, comprising:
inner and outer rows of coils arranged side by side and defining a border;
a central cavity defined by said border;
a flat border wire positioned above and between said inner and outer rows of coils, the larger surfaces of said flat wire being in a plane perpendicular to the axes of said coils;
means connecting said flat wire to the upper portions of at least a plurality of said coils, the circumference of said flat border wire being such that the border wire exerts an inward force on the border assembly, whereby the border assembly will lean slightly inwardly in the absence of a mattress positioned in said central cavity.

4,462,130

PROCESS FOR TREATING TEXTILE FIBERS

Edward V. Burnthall, Lyman, S.C., assignor to Beu-Tex Corporation, Morgantown, N.C.

Filed Jun. 21, 1982, Ser. No. 390,201
Int. Cl.³ D06B *3/02, 21/00*
U.S. Cl. 8—149.1 **5 Claims**



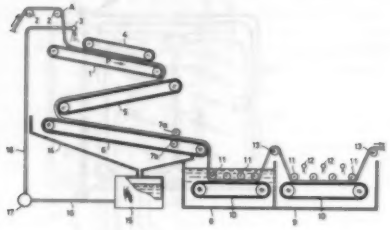
1. In a process for continuously dyeing or chemically treating textile staple length fibers having thermoplastic properties while conveying the fibers in a desired path of travel and including the steps of impregnating the moving fibers with a desired amount of liquid dye or other chemical, and compressing and advancing the compressed impregnated fibers into and through a confined heating zone for reaction of the dye or chemical therewith; the improvement comprising the step of preheating the fibers to a temperature below their second order transition point and below the reaction temperature of the dye or other chemical applied to the fibers to compact and reduce the bulk of the fibers before their compression and delivery into said confined heating zone.

4,462,131

PROCESS AND APPARATUS FOR THE MERCERIZATION OF SLIVERS

Mitsuhiro Hotani, Ibaraki, Japan, assignor to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1982, Ser. No. 412,521
Int. Cl.³ D06B 7/02
U.S. Cl. 8—151.2 5 Claims



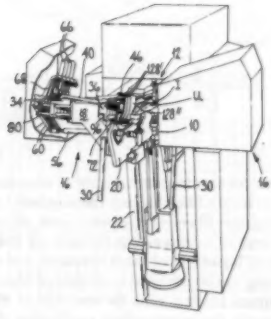
1. A method of mercerizing a sliver which comprises impregnating a cellulosic fiber-containing sliver with an aqueous solution of caustic soda of a high concentration; transporting the impregnated slivers held between a belt conveyor and a press belt in a downwardly inclined direction; transferring the sliver from said belt conveyor onto a net conveyor having mesh openings therein; mercerizing the sliver while being transported by said net conveyor, whereby the excessive caustic soda solution on the sliver drips through the mesh openings of the net conveyor; squeezing the caustic soda solution out of the sliver by means of squeeze rollers, and then washing the squeezed sliver with water while transporting said sliver to another net conveyor containing press rollers thereon, said washing being effected by passing the sliver between said net conveyor and press rollers located in a water-washing tub.

4,462,132

SHOE UPPER CONFORMING MACHINE

James R. Flanders, Blaby, England, assignor to USM Corporation, Farmington, Conn.

Filed Nov. 2, 1981, Ser. No. 316,980
Claims priority, application United Kingdom, Nov. 7, 1980, 8035768
Int. Cl.³ A43D 21/00, 23/00
U.S. Cl. 12—85 6 Claims



1. A shoe upper conforming machine for use in lasting side portions of shoe upper comprising:

a support for a shoe last on which an upper, the side portions of which are to be lasted, and an insole are positioned; and

a pair of side lasting assemblies arranged so as to act on opposite side portions of an upper positioned on a last supported by said support,

wherein each side lasting assembly comprises clamping means, comprising a plurality of clamp members movable independently towards the last support to cause a side portion of the upper to be held against the last, on which it is positioned and which is supported by the last support, at localities spaced from the featherline thereof; and lasting band means comprising at least one upper-engaging band portion of flexible sheet material arranged to be interposed between the shoe upper and the clamp members, the or each upper-engaging band portion being held by the clamp members, in the operation of said machine, against the upper positioned on its last under a pressure which does not prevent movement of the upper-engaging band portion(s) relative to the clamp members but which is sufficient to cause such movement of said portion(s) to apply a drafting force to the portion of the upper engaged thereby,

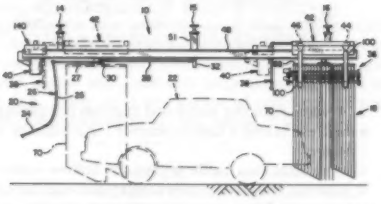
the arrangement being such that, in the operation of the machine, a drafting force is applied to the upper by said portion(s) heightwise of the last in the direction of the featherline of the shoe and lasting marginal portions of the upper are caused to be wiped over corresponding marginal portions of the insole and be pressed thereagainst, wherein each clamp member is mounted for pivotal movement about an axis extending heightwise of the last.

4,462,133

VEHICLE WASHING APPARATUS WITH ELEVATABLE WASHING ELEMENTS

Daniel C. Hanna, 1133 SW. Rivington Dr., Portland, Oreg. 97201

Filed Jan. 17, 1983, Ser. No. 458,537
Int. Cl.³ B60S 3/04
U.S. Cl. 15—97 B 18 Claims



1. A car washing apparatus comprising:

flexible curtain-like cleaning means,

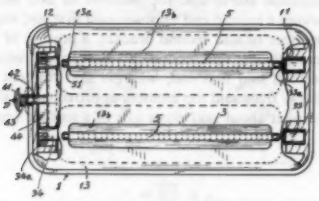
overhead support means for suspending said curtain-like means vertically into a vehicle space to clean a vehicle in said space upon relative movement between said vehicle and said support means,

and elevating means for elevating a portion of said curtain-like means relative to said support means to clear said vehicle space, said elevating means including laterally displaceable means movable into said curtain-like means below said overhead support means to swing said curtain-like means upwardly about its connection to said support means.

4,462,134
BLACKBOARD ERASER

Jeng-Lin Wang, Rm. 37, 11th Fl., No. 25, Ming-Sheng E. Rd., Taipei, Taiwan

Filed Dec. 20, 1982, Ser. No. 451,595
Int. Cl.³ B43L 21/00
U.S. Cl. 15—98 5 Claims



1. A blackboard eraser comprising:

a base;

an uppermost cover mounted on said base and forming a storing chamber for accumulating dust therein, which is spaced between said uppermost cover and said base; two erasing rollers each rotatably mounted within said base;

a controller normally engaging with said rollers during erasing operation to prevent rotation or for releasing said rollers for their free rotation for dust removal; and two dust scrapers respectively fixed on said base, each resiliently contacting the upper perimeter of each roller.

4,462,135
CLEANING AND ABRASIVE SCRUBBERS AND METHOD FOR THEIR PREPARATION

Howard R. Sanford, 348 E. 400 South, Springville, Utah 84663

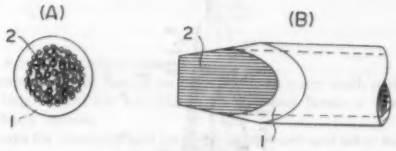
Filed Jan. 24, 1983, Ser. No. 460,171
Int. Cl.³ A47L 13/16
U.S. Cl. 15—105 20 Claims

2. An exteriorally hand held cleaning and abrasive scrubber which is capable of providing both a cleaning and an abrasive action, comprising an instrument made up of a hollow cone shaped cleaning section joined at its apex to the apex of a hollow substantially cone shaped abrasive section, said cleaning section comprising a hollow cone shaped soft bun, the outer walls of which are made up of a plurality of plys of an extruded tubular netting mesh prepared form special polymeric material, said plys of tubular mesh being concentrically folded upon itself numerous times to form the said walls of the soft bun, the end of said plys of tubular mesh being extended through the open center of the hollow bun to act as a center core to receive the abrasive section, said abrasive section comprising numerous coils of an abrasive solid coiled around the center core to form a hollow abrasive bun, the said center core being extended outwardly and around the abrasive solid and toward the cleaning section and being tightly and securely attached to the outer bottom portion of the cleaning section so as to form the cone shapes of the cleaning and abrasive sections and to secure the abrasive section to the bottom portion of the cleaning section, the special polymeric material used in making the tubular netting mesh comprising a strong, flexible polymer of the group consisting of addition polymers of olefinic monomers, and polyamides of polycarboxylic acids and polyamides.

4,462,136
DENTAL IMPLEMENT FOR REMOVING PLAQUE AND MASSAGING GUMS

Shunichi Nakao, Sakado; Motonori Yamauchi, Yokosuka, and Churyo Suzuki, Ichikawa, all of Japan, assignors to Showa Jakuhin Kako Co., Ltd. and Tokyo Boshi Kabushiki Kaisha, both of, Japan

Filed Nov. 9, 1981, Ser. No. 319,605
Claims priority, application Japan, Nov. 18, 1980, 55-162346
Int. Cl.³ A46B 9/04; A61C 15/00
U.S. Cl. 15—167 R 5 Claims



1. A dental implement for removing plaque and massaging gums, which comprises a slender rod-like body in the form of a toothpick having an inner fibrous structure formed of a plurality of fibers arranged in a longitudinal direction, and an elongated shell layer consisting essentially of a thermally melt-adhered thermoplastic resin surrounding and in direct contact with said inner fibrous structure and having a greater physical strength as compared with that of said inner fibrous structure, said shell layer being partly cut or ground down so as to terminate remote from an end of said inner fibrous structure to expose said fibrous structure and thus to provide a brushing section.

4,462,137
ELECTRIC VACUUM CLEANER

Robert C. Berfield, Jersey Shore, and Richard M. Fegan, Montoursville, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Filed Jan. 3, 1983, Ser. No. 455,312
Int. Cl.³ A47L 7/00
U.S. Cl. 15—353 26 Claims

13. An electric vacuum cleaner, comprising:

a suction motor for moving air past itself;

a motor housing for containing the motor; the housing having a bottom, a top, an air inlet at the bottom, and an air outlet;

a collecting tank for collecting materials drawn into the tank; the collecting tank having a bottom; an inlet into the bottom of the tank for entrance of air and collected materials to be sucked into and collected in the tank; the tank having a top; a cover over the tank top;

first connecting means extending up from the tank cover; second connecting means at the bottom of the motor housing; the first and second connecting means being connected together for joining the tank and the motor housing; the first and second connecting means also including and defining an air flow pathway therethrough for air to flow from the tank into the motor housing;

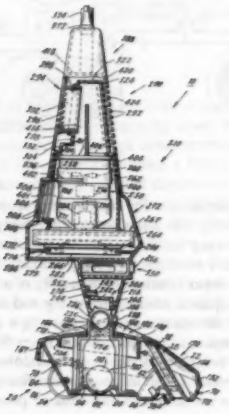
the suction motor being a bypass type motor, including a fan driving motor, a main suction fan connected with the driving motor for being driven to move air through the main suction fan, a secondary cooling fan also connected with the driving motor for being driven to move air past the cooling fan and the cooling fan being placed and

operable for blowing cooling air over the driving motor, and a casing over the suction motor;

the casing having a main fan inlet at the inlet side of the main suction fan, a main fan outlet for passing therethrough air blown by and past the main suction fan, a secondary fan inlet at one side of the driving motor and a secondary fan outlet at the opposite side of the driving motor; and the secondary cooling fan being oriented and operable for moving air into the casing through the secondary fan inlet, over the driving motor, and out of the casing through the secondary fan outlet;

mounting means mounting and supporting the suction motor in the motor housing; the suction motor being oriented so that the main fan inlet communicates into the bottom of the motor housing for receiving air entering the motor housing from the tank;

the motor housing having a main housing outlet there-



through for passing air from the main fan outlet, a secondary housing inlet for inlet of air to the secondary fan inlet, and a secondary housing outlet for outlet of air from the secondary fan outlet;

cuff means of resilient material located in the housing and passing over the bypass type suction motor, the cuff means being shaped and positioned for contacting the motor casing and for separating from each other the air flow through the main fan outlet, the secondary fan inlet and the secondary fan outlet; the cuff also being shaped and positioned for connecting the main fan outlet with the main housing outlet, the secondary fan inlet with the secondary housing inlet and the secondary fan outlet with the secondary housing outlet; the mounting means for the suction motor also being shaped for separating the main fan inlet from the main fan outlet and for separating the main fan inlet from the secondary fan inlet and from the secondary fan outlet.

4,462,138

WHEEL BRACKET ASSEMBLY HAVING A RESILIENT ELEMENT WITH PROGRESSIVELY INCREASING RESISTANCE

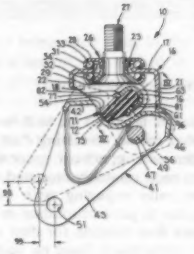
John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Continuation of Ser. No. 260,509, May 4, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,575

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—44 **9 Claims**

1. A wheel bracket assembly, comprising a first bracket having spaced, downwardly extending first side flanges; a second bracket having a top member and spaced second flanges extending downwardly from opposite sides of said top member, said second bracket being disposed between said first side flanges and pivotally supported on said first bracket for movement about a substantially horizontal pivot axis, said second side flanges having means facilitating rotatable support of a wheel therebetween; and resilient means for yieldably resisting pivotal movement of said second bracket in one direction about said pivot axis, said resilient means including a resilient element having a first end supported by said first bracket at a location above said top member of said second bracket and having a second end opposite said first end engaging said top member of said second bracket, a portion of said resilient element adjacent said second end increasing gradually in thickness toward said first end; wherein said resilient element extends away from said top member approximately along a path of movement about said pivot axis of a surface area of



said top member which is engaged by said second end of said resilient element; wherein said top member has a transverse, upwardly facing concave groove therein, said second end of said resilient element engaging said top member within said transverse groove; wherein said resilient element has a width which is less than the distance between said first side flanges; wherein said first end of said resilient element is a transversely extending semicylindrical head; wherein said resilient element has a transversely extending concave groove on each side thereof adjacent said head; and wherein said first bracket includes an omega-shaped clip extending between said first side flanges and support means on said first side flanges cooperable with respective ends of said clip for securely supporting said clip thereon, said clip securely gripping around said head of said resilient element and each leg of said clip engaging a respective said transverse groove in said resilient element.

4,462,139

MEAT PROCESSING MACHINE

Raymond W. Hubbard, 1746 W. Longview Ave., Stockton, Calif. 95201, and Thomas W. Hubbard, 3641 W. Michigan, Stockton, Calif. 95204

Filed Dec. 31, 1981, Ser. No. 336,037

Int. Cl.³ A22C *9/00*

U.S. Cl. 17—27 **7 Claims**

1. An improved meat processing machine comprising

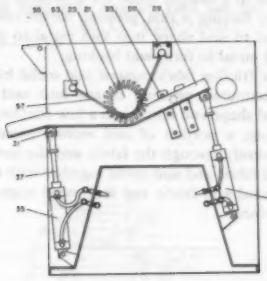
a frame,

a roller removably supported in said frame for rotation and having a multiplicity of projections disposed thereon for penetrating a piece of meat,

a floating pressure plate adjustably disposed in said frame proximate said roller,

at least one pressure responsive telescoping cylinder adjustably secured to said plate and disposed to hold said plate proximate said roller with adjustable pressure, and

means for controlling the force with which the cylinder holds the plate proximate said roller in response to pressure applied to said plate and said cylinder by meat being processed between said roller and said plate.

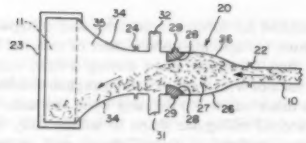


4,462,140

PNEUMATIC LEVELING DEVICE FOR FIBER FEEDING APPARATUS

Dennis E. Wood, Fairport, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Filed Sep. 7, 1982, Ser. No. 415,370
Int. Cl.³ D01G *15/40*
U.S. Cl. 19—105 **12 Claims**



1. Apparatus for pneumatically filling a supply chute with a uniform column of fibers comprising

a transport duct for conveying a stream of air-borne fibers from a supply thereof to the upper end of a feed chute for a carding machine or the like,

a connecting duct having an inlet end operatively connected to said transport duct to receive a stream of air-borne fibers therefrom, and having an outlet end connected to the upper end of said feed chute,

means adjacent the inlet end of said connecting duct for accelerating the stream of fibers entering said connecting duct,

deflecting means connected to said connecting duct downstream from said accelerating means and operative intermittently to cause said stream of fibers to be deflected back and forth between opposite sides of said connecting duct, and

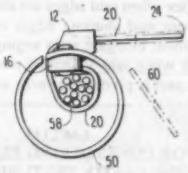
diffusion means formed in said connecting duct between said deflecting means and said chute and operative to cause said stream of fibers, after deflection thereof toward either side of said connecting duct, to cling to the last-named side of said connecting duct to be guided thereby toward the corresponding side of said chute.

4,462,141

FLEXIBLE LOCKING CLAMP USED WITH TUBULAR GUARD FOR LINEAR BODY

Charles E. Bogese, Roanoke, Va., assignor to Virginia Plastics Company, Roanoke, Va.

Filed Jul. 17, 1981, Ser. No. 284,386
Int. Cl.³ F16L *33/00*; E04H *12/20*
U.S. Cl. 24—16 PB **11 Claims**



1. Apparatus, which comprises:

a tubular guard having an inner wall, an outer wall, and a longitudinal slit adapted to receive and house a linear body therein;

means for clamping said linear body adjacent said inner wall of said guard, said clamping means including a flexible strap, a body portion having a head portion and means for receiving and locking said strap, and means extending integrally from said body portion for securing said clamping means to said guard; and

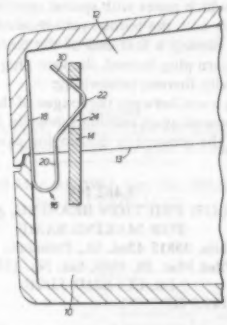
aperture means formed in said guard through which said head portion and said strap extend.

4,462,142

FASTENERS

David J. Hickling, Chilwell, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Jun. 11, 1982, Ser. No. 387,346
Claims priority, application United Kingdom, Jun. 12, 1981, 8118220
Int. Cl.³ A44B *13/02*
U.S. Cl. 403—329 **3 Claims**



1. A fastener for a first and a second part of a hollow body, each of said parts having an edge about which said parts are relatively pivotable, said edges abutting when said first and second parts are secured together and forming a coplanar surface of said first and second parts, said fastener comprising a resilient elongate strip including a substantially U-shaped strip having two legs and a U-shaped portion, one of the legs being straight and secured internally of said first part adjacent to said edge thereof, said U-shaped portion extending into said second part and adjacent to an edge thereof, said elongate strip further including a substantially V-shaped portion formed

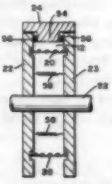
therein, said V-shaped portion projecting inwardly of and contained in said first part, a member attached internally of said second part spaced from said edge thereof and an orifice formed in said member so as to be contained within said first part, said orifice being shaped to receive said V-shaped portion of said elongate strip to locate said elongate strip, said V-shaped portion entering into said orifice when said edges are abutted and said first part is pivoted about said abutting edges towards said second part and said V-shaped portion retracting from said orifice when said edges are abutted and said first part is pivoted about said abutting edges away from said second part, said resilient elongate strip urging said first and second parts together when said V-shaped portion enters said orifice and said first part is pivoted towards said second part.

4,462,143

METHOD FOR CONTROLLING TEXTURE LEVEL IN A MOVING CAVITY TEXTURING PROCESS

Hendrikus J. Oswald, Morristown; Hsin L. Li, Parsippany, and Russell H. Butler, Rockaway, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 12, 1982, Ser. No. 357,396
Int. Cl.³ D02G 1/12, 1/16
U.S. Cl. 28—257 **2 Claims**



1. A method for monitoring the texture level of a yarn during texturing in a moving cavity texturing apparatus, the cavity having an inlet opening for receiving the yarn and a hot fluid to advance the yarn, a porous yarn-receiving means forming one wall of the cavity which provides for partial removal of the hot fluid serving to reduce the pressure in the cavity, a stationary shoe provided with a tongue which is positioned between and which mates with spaced apart moving sidewalls which advance with the porous yarn-receiving means, a shoe extension for closing a first end of the cavity, an outlet for removal of a yarn plug formed, the yarn plug closing a second end of the cavity therein, comprising:

maintaining a seal between the tongue of the stationary shoe and the spaced apart moving sidewalls, the

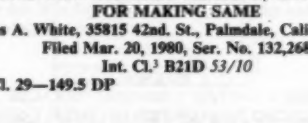
monitoring the pressure in the moving cavity.

4,462,144

STAMPED LOW FRICTION BEARING, AND PROCESS FOR MAKING SAME

Charles A. White, 35815 42nd. St., Palmdale, Calif. 93550

Filed Mar. 20, 1980, Ser. No. 132,268
Int. Cl.³ B21D 53/10
U.S. Cl. 29—149.5 DP **20 Claims**



1. A process for producing an open-ended cylindrical low friction bearing with a low friction surface and a metal backing, comprising the simultaneous steps of:

urging a sheet of malleable metal against a die contoured to correspond to a desired shape for a backing of a shaped bearing by forcing a first pressing means contoured to correspond to said shape into said metal to stretch and shape said metal to form said backing;

urging a low friction fabric against said metal by forcing a second contoured pressing means into said fabric to stretch and shape said fabric into a low friction surface of said bearing, a portion of said second pressing means passing entirely through the fabric and the metal; and

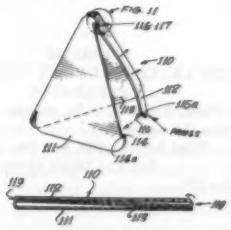
pressing said fabric and said metal together with force sufficient to bond said fabric and said metal together across their interface.

4,462,145

METHOD OF MAKING A PORTABLE AND COLLAPSED STRUCTURE

Herbert C. Schulze, P.O. Box 6070, Incline Village, Nev. 89450

Filed Feb. 23, 1981, Ser. No. 237,118
Int. Cl.³ B23P 19/00
U.S. Cl. 29—428 **4 Claims**



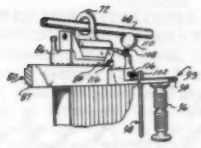
1. The method for forming a portable and collapsed structure as follows: (1) defining upon a sheet of material having a thickness a first triangular shape having a first, second and third edge, each of which edges is at an angular relationship to each of the other edges; (2) defining upon the same sheet of material a second triangular shape of substantially the same size and shape as the first defined shape, said second shape having a first, second and third edge, each of which edges is at an angular relationship to each of the other edges and wherein the second edge of the second shape is the same as the third edge of the first triangular shape; (3) defining a third shape of substantially the same size and shape as the first shape upon said sheet of material, said third shape having a first, second and third edge, each of which edges is at an angular relationship to each of the other edges and wherein the second edge of the third shape is the same as the third edge of the second shape; (4) reducing the thickness of the article upon one of its sides along the common line of the third edge of the first shape and the second edge of the second shape; (5) reducing the thickness on the other side of said article along the line defining the third edge of the second shape and the second edge of the third shape; (6) forming interengageable portions on the second edge of the first shape and the third edge of the third shape whereby said second edge of the first shape and third edge of the third shape are engageable to form a pyramidal body; (7) folding the first shape against the second shape along the side opposite the side where thickness has been reduced between the said first and second shapes; and (8) folding the third shape against the second shape along the side opposite the side where thickness has been reduced between the said second and third shapes.

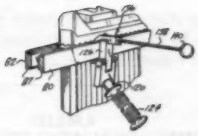
4,462,146

RADIATOR RECORING FIXTURING AND TOOLS

Richard Desiro, 42995 Ambridge, Northville, Mich. 48167

Division of Ser. No. 268,551, Jun. 1, 1981, Pat. No. 4,411,414. This application Aug. 10, 1983, Ser. No. 521,948
Int. Cl.³ B23P 11/00
U.S. Cl. 29—243.5 7 Claims





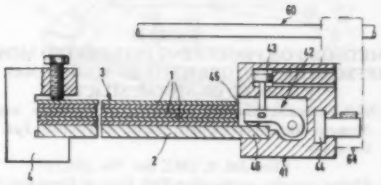
1. A decrimping tool for use in crimping tabs of automotive radiators of the type including a radiator core, a header secured to said radiator core, and a tank joined to said header by a series of tabs bent over a radiator tank flange, said tabs in the crimped position extending immediately adjacent a radiator tank side wall extending generally normally to said radiator tank flange, said decrimping tool comprising a tool frame including an elongated bar section, a handle extending generally transversely from one side of said elongated bar section and an oppositely extending anchor block adjacent to the opposite end of said bar section, a spring loaded plunger slidably mounted within the lower region of said anchor block, said spring loaded plunger extending generally parallel to said bar section and adapted to protrude from either side of said anchor block, a trigger rod pivotally mounted to said bar section having a lower portion extending in the same general direction as said handle and adjacent thereto to enable simultaneous gripping of said handle and squeezing of said lower portion of said trigger rod, said trigger rod including an engagement portion extending adjacent one end of said spring loaded plunger to be extended upon compression thereof by pivoting movement of said trigger rod beyond said opposite end of said bar section; a finger extending reversely from said anchor block towards said plunger end protruding away from said opposite end of said bar section and a knob mounted atop said anchor block enabling a downward pressure to be exerted on said finger; whereby said decrimping tool may enable decrimping of said tabs by positioning said finger behind and in registry with a crimped tab, exerting downward pressure on said knob and squeezing of said trigger rod to force said finger laterally away to decrimp said tab.

4,462,147

METHOD FOR SIMULTANEOUS MACHINING OF A STACK OF PLATE-LIKE WORKPIECES

Eugen Herb, Ditzengen, and Berthold Leibinger, Gerlingen, both of Fed. Rep. of Germany, assignors to Trumpf America, Inc., Farmington, Conn.

Division of Ser. No. 944,165, Sep. 20, 1978, Pat. No. 4,270,253. This application Aug. 11, 1980, Ser. No. 176,902
Int. Cl.³ B23P 11/00
U.S. Cl. 29—423 6 Claims



1. In a method for machining simultaneously a stack of workpieces, the steps comprising:

A. assembling a stack of platelike workpieces onto a base plate of similar material to produce a workpiece assembly;

B. applying means to temporarily secure said workpieces in said stack on said base plate;

C. drilling at least two spaced apertures through said workpieces of said stack and in said base plate;

D. inserting rivets into said drilled apertures and deforming said rivets within said apertures in said workpieces and said base plate to secure said workpieces on said base plate in fixed relationship within said workpiece assembly;

E. removing said temporary securing means and engaging said workpiece assembly with automatic movement means;

F. automatically moving said stack on a work supporting surface of a table to a machining station;

G. automatically machining simultaneously said workpieces of said stack and at least a portion of the depth of said base plate by movement of said assembly relative to machining means at said station;

H. automatically moving said assembly on said table to a drilling station;

I. drilling out said rivets of said stack;

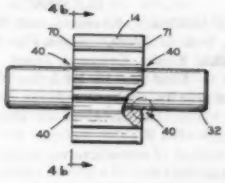
J. disassembling said workpieces of said stack from said base plate.

4,462,148

METHOD OF AXIAL RETENTION OF GEAR ON SHAFT

Arthur B. Joyce, Corinth, Miss., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 18, 1982, Ser. No. 359,625
Int. Cl.³ B23P 11/02
U.S. Cl. 29—447 5 Claims



1. In a metallic gear torsionally and axially secured to a metallic shaft, the gear including a bore having a diameter smaller than the diameter of said shaft, through which the shaft

extends, and defining external annular interface regions at the junction of gear and shaft members, an improved method of axially securing said gear to said shaft comprising the steps of (a) heating the gear, (b) cooling the shaft, (c) inserting the cooled shaft into the bore of the heated gear, (d) allowing the temperatures of the gear and shaft to equalize and (e) then applying compressive forces to the metal at said regions, said forces being of magnitudes sufficient to produce plastic deformation of the metal of said gear and shaft within said interface region, wherein said compressive forces are applied by a wheel moved relatively about said interfaces of said gear and shaft.

4,462,149

METHOD FOR PRODUCING INTEGRATED MOS FIELD EFFECT TRANSISTORS WITH AN ADDITIONAL TRACK LEVEL OF METAL SILICIDES

Ulrich Schwabe, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,727

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132809

Int. Cl.³ H01L *21/283*

U.S. Cl. 29—571 **5 Claims**

1. In a method of producing integrated MOS field effect transistors, particularly complementary MOS field effect transistor circuits (CMOS-FET's) wherein a metal layer structure consisting of a metal silicide having a high melting point, comprising a silicide of molybdenum, tungsten, tantalum or titanium, is utilized as an additional interconnect, with the metal silicide layer being applied after the fabrication of the polysilicon level, the forming of active MOS regions, the application of an insulating oxide and the opening of contact holes, and phosphorous glass layer is utilized as an intermediate oxide between the metal silicide level and the metal interconnect, wherein the improvement comprises:

substantially simultaneously opening, in one method step, contact areas to the active MOS and polysilicon regions for the metal silicide level as well as for the metal interconnect after the application of the insulating oxide and before the application of the metal silicide level; and

structuring the metal silicide level in such a manner that during a flow-spread of the phosphorous glass layer functioning as an intermediate oxide, the p^+ regions of the circuit remain covered by the metal silicide level.

4,462,150

METHOD OF FORMING ENERGY BEAM ACTIVATED CONDUCTIVE REGIONS BETWEEN CIRCUIT ELEMENTS

Hidetaro Nishimura, Kawasaki, and Hiroshi Nozawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 16, 1982, Ser. No. 419,067

Claims priority, application Japan, Nov. 10, 1981, 56-179984

Int. Cl.³ H01L *21/263, 21/26*

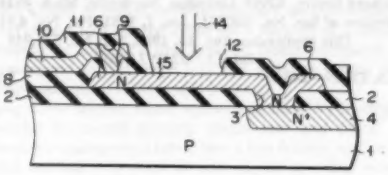
U.S. Cl. 29—576 B **8 Claims**

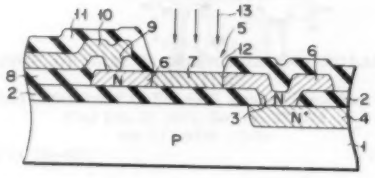
1. A method of manufacturing semiconductor devices comprising the steps of:

forming circuit elements making up an integrated circuit on a semiconductor substrate of one conductivity type;

forming on said semiconductor substrate a spare element connected to said circuit elements through an electrically non-active region;

forming an impurity region by introducing ions into said non-active region;





connecting electrically said circuit elements to said spare element by electrically activating impurity ions of said impurity region.

4,462,151

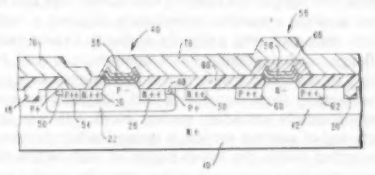
METHOD OF MAKING HIGH DENSITY COMPLEMENTARY TRANSISTORS

Henry J. Geipel, Jr.; Ronald R. Troutman, both of Essex Junction, and John M. Wursthorn, Underhill Center, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1982, Ser. No. 446,793

Int. Cl.³ H01L *21/22, 29/78, 11/14*

U.S. Cl. 29—576 B **15 Claims**



1. A process for making a complementary metal oxide semiconductor (CMOS) structure comprising the steps of:

forming a well having a P type conductivity in a semiconductor substrate having an N type conductivity,

forming first and second N type conductivity regions defining a channel region within said well,

forming within said well a P type region having a more positive conductivity than that of said well surrounding said first and second N type conductivity regions and said channel region and having a contact region within said P type conductivity region butted with respect to one of said first and second N type conductivity regions,

forming a P channel device having a control electrode and source and drain regions in said semiconductor substrate without said P type well, said source and drain regions being formed simultaneously with said contact region,

forming a control electrode over said channel region having

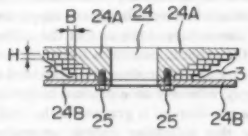
a different work function from that of the work function of the control electrode of said P channel device and forming a single electrode in contact with said contact region and said one N type conductivity region.

4,462,152

METHOD OF MOUNTING COILS ON THE ROTOR OF A SUPERCONDUCTIVE ROTARY ELECTRIC MACHINE

Kouichi Okamoto; Norio Oishi, both of Kobe; Masaki Sakuyama, Ashiya; Tatsuei Nomura, Itami; Tadatoshi Yamada, Kobe, and Masatami Iwamoto, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,774
Claims priority, application Japan, Apr. 2, 1981, 56-50883
Int. Cl.³ H02K *15/09*
U.S. Cl. 29—598 **3 Claims**



1. A method of winding a coil of superconductive linear material in a flat planar shape and mounting it on the cylindrical surface of a coil-carrying shaft of a rotor of a superconductive rotary electric machine, said method comprising:

forming at least two parallel grooves in the cylindrical side surface of the coil-carrying shaft with the length of the grooves extending in the axial direction of the coil-carrying shaft and the depth of the grooves extending radially of the coil-carrying shaft;

forming a pair of annular recesses in said surface of the coil-carrying shaft extending in the circumferential direction of the coil-carrying shaft, each of said annular recesses being connected between corresponding ends of said axially extending grooves;

winding a length of superconductive linear material into a coil formed of a stack of a plurality of turns each in the form of a flat planar substantially rectangular ring having sides symmetrical about a longitudinal turn axis and transverse ends with the sides each having the same length and the ends of the turns being superposed directly on top of each other with the longitudinal axes one above the other, and the ends of the successive turns from one end of the stack to the other in the direction of stacking having greater lengths with the sides of the superposed turns being offset laterally outwardly in the plane of the turn relative to the sides of the next adjacent turn in the stack, and the four straight portions of each turn being connected with each other by circularly curved linear material portions; and

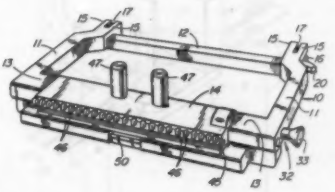
bending the ends of the turns in said coil such that said ends are slightly curved and conform to said annular recesses and the respective sides of the coil become aligned such that they substantially match said radially extending parallel grooves and disposing them in said recesses and disposing the sides of said turns in said coil in said grooves formed in said surface of the coil-carrying shaft.

4,462,153

TERMINATING TOOL FOR CROSS-CONNECT CONNECTORS FOR TELEPHONE LINES

George DeBortoli, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 1, 1981, Ser. No. 298,485
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—760 **9 Claims**



1. A terminating tool for cross-connect connectors, said tool comprising a planar rectangular frame structure including:

two spaced apart side members;

a back member extending between and connecting the rear ends of the side members;

an inwardly projecting portion at the forward end of each side member, the portions having opposed inner ends;

a rotatable member extending between said opposed inner ends, said rotatable member pivotally supported in said inwardly projecting portions for rotation about an axis within said rotational member;

a retractable stop mounted in one of said inwardly projecting portions and moveable in a direction parallel to said axis to be selectively engaged in one of a plurality of recesses in an immediately adjacent end of the rotatable member, the recesses spaced around said axis;

said rotatable member being of substantially rectangular cross section in a plane normal to said axis, a slot extending along a front edge of the rotatable member and extending inwards from said front edge for receiving and holding a connector, and a latch member pivotally mounted in a bottom surface of the rotatable member below said slot, the latch member having a forward end extending up in front of said front edge of said rotatable member into said slot, to engage with a connector positioned in said slot, to retain said connector in position, means for pivotting said latch to move said forward end of said latch member from said slot, and means biasing said latch to move the forward end into said slot;

and mounting means at the rear of each side member for releasably mounting the tool on a support member.

4,462,154

HOLDER FOR USE IN ASSEMBLING TOP END-STOPS TO SLIDE FASTENERS

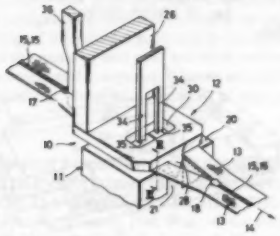
Toyoo Morita, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,346
Claims priority, application Japan, Dec. 30, 1981, 56-194659
Int. Cl.³ A41H *37/06;* **B21D** *53/50*
U.S. Cl. 29—767 **5 Claims**

1. A holder for laterally spacing the opposite inner edges of a pair of continuous slide fastener stringers in a punch and die assembly adapted to apply top end-stops to opposite rows of coupling elements on the opposite stringer tape edges, said holder comprising:

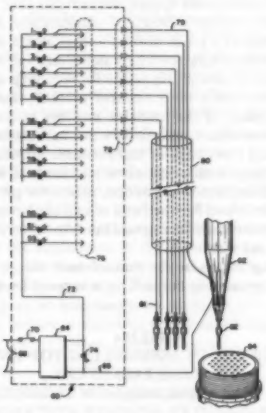
(a) a fixed support member having a first surface for supporting thereon the stinger tapes, a groove extending horizontally through said support member and opening to said first surface, and a pair of recesses extending in said first surface along the opposite edges of said groove for receiving therein the respective rows of coupling elements; and

(b) a reciprocable guide member having a second surface confronting said first surface, said guide member being movable toward said support member to a position at which said first and second surfaces jointly define therebe-



tween a space slightly larger than the thickness of the stringer tapes, a pair of spaced projections depending from said second surface and receivable in said groove, and an aperture extending between said projections for providing punch clearance.

4,462,155
PIN LOCATOR
Dennis S. Brunelle, South Hadley, Mass., and Daniel A. Esakov, West Hartford, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed Apr. 1, 1982, Ser. No. 364,348
Int. Cl.³ H01R *43/00*; B23P *21/00*
U.S. Cl. 29—857 **7 Claims**



1. A method of connecting an electrical cable formed of a plurality of individual conductors to an end connector wherein a plurality of pin elements, one pin element attached to each of the individual conductors at the end of the cable to be connected to the end connector, are matched with and inserted into a particular insertion location in a plurality of openings in the face of the end connector for receiving the pin elements, comprising:

a. providing an array of a plurality of indicating means replicative of the openings in the face of the end connector to be connected to the cable;

b. electrically interconnecting each indicating means of the array between a source of electric current and one of the individual conductors at the end of the cable opposite to the end of the cable to be connected to the end connector; and

c. sequentially grounding each individual pin element thereby causing electric current to flow through and activate the indicating means associated with the grounded pin element and inserting the grounded pin element into the particular insertion location in the face of the end connector corresponding to the activated indicating means.

2. An apparatus for connecting an electrical cable formed of a plurality of individual conductors to an end connector wherein a plurality of pin elements, one pin element attached to each of the individual conductors at the end of the cable to be connected to the end connector, must be matched with and inserted into a particular insertion location in a plurality of openings in the face of the end connector for receiving the pin elements, comprising:

a. a power supply;

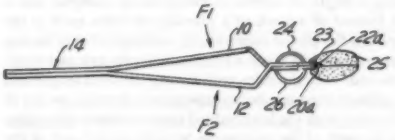
b. display means;

c. a plurality of indicating means arranged on the display means in an array replicative of the openings in the face of the end connector to be connected to the cable;

d. tool means for grasping one of the pin elements and inserting the grasped pin element in one of the plurality of openings in the face of the end connector; and

e. circuit means for electrically interconnecting each of the indicating means between the power supply and one of the individual connectors at the end of the cable opposite to the end of the cable to be connected to the end connector and for electrically interconnecting the tool means to the power supply whereby an electrical circuit is completed whenever a pin element is grasped in the tool means so as to activate the indicating means associated with the grasped pin element thereby indicating on the display means the particular insertion location in the plurality of openings in the face of the end connector into which the grasped pin element is to be inserted.

4,462,156
PISTACHIO NUT OPENER
Patricia J. Himelhoch, 1024 Briarcliffe, Flint, Mich. 48504
Filed Oct. 26, 1981, Ser. No. 315,210
Int. Cl.³ A47J *23/00*
U.S. Cl. 30—113.2 **2 Claims**



1. An opener for nuts comprising:

a pair of resilient levers;

a connecting means for joining one end of each said levers to the other;

a pointed end portion formed at the other free end of each of said levers;

a sharpened side portion included in each of said end portions and having a concave contour corresponding to the nut shell curvature; and

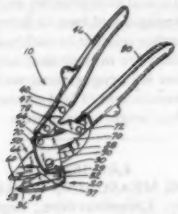
a raised shoulder mounted on each such end portion for limiting the degree of entry of the pointed ends into the nut shell, said shoulder comprising a raised loop portion fastened to the outer surface of each such end portion.

4,462,157

SNIPS AND SHEARS

John M. Aiken, Hastings, Nebr., assignor to The Stanley Works, New Britain, Conn.

Filed Aug. 14, 1981, Ser. No. 292,954
Int. Cl.³ B26B 13/06
U.S. Cl. 30—259 33 Claims



1. A tool for cutting rigid material, said tool comprising:

a lower sheet metal blade including a substantially horizontally disposed body and a substantially vertically disposed support neck, said body including a first horizontal section adjacent said neck and extending laterally therefrom and an intermediate section extending generally downwardly from said horizontal section and away from the plane of said neck, said intermediate section also extending forwardly of said neck with the side edge adjacent the plane of said neck being spaced from said plane of said neck, said side edge of said intermediate section forming a first cutting edge;

an upper sheet metal blade including a second cutting edge along its side adjacent said connecting neck of said lower blade, said blades being relatively movable between a first position in which said second cutting edge is disposed in a closed mating position with said first cutting edge and a second position in which said cutting edges are spaced apart;

means pivotally connecting said upper blade to said support neck for pivotal movement between said first and second positions; and

first and second handles respectively connected to said lower and upper blades at the ends spaced from said cutting edges for moving said blade relative to each other between said first and second positions, said upper blade including an elongated slot, and said second handle being slidably and pivotably attached to said upper blade, and pivotably attached to said lower blade.

4,462,158

HAND-GUIDED MOTOR DRIVEN WORKING DEVICE

Anton Wehle, Fellbach, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 406,081
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131382
Int. Cl.³ B27B 17/00
U.S. Cl. 30—381 16 Claims

1. A hand-guided, motor driven working device having at least one tool, the device comprising:

a motor housing;

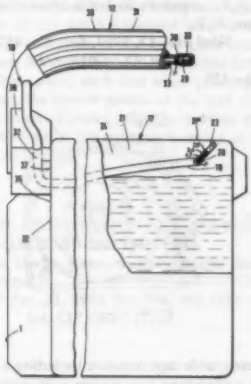
a carrying handle attached to said housing;

a fuel tank having a tank chamber;

a venting device operatively communicating with said fuel tank and including a flexible tube which projects from an upper part of said fuel tank and has a free end which is closed except for a labyrinth-like opening;

a covering defined by said carrying handle, said tube being arranged at least partially in said covering; and,

a chamber located externally of said housing, said chamber being essentially free of dirt and being located as far as



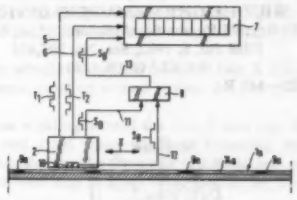
possible from said fuel tank, said tool, and said motor, said tube being guided to said dirt-free chamber.

4,462,159

REFERENCE MARK SELECTION SYSTEM FOR MEASURING APPARATUS

Güenther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,586
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245914
Int. Cl.³ H01J 3/14
U.S. Cl. 33—125 C 16 Claims



1. In a measuring system which comprises a measuring scale, a measuring graduation defined on the scale, a plurality of reference marks positioned at predetermined positions on the scale with respect to the graduation, and a scanning unit which includes means for generating a reference signal when the scanning unit is aligned with one of the reference marks, the improvement comprising:

at least one electrically applied selection indicator aligned with at least one of the reference marks;

means, included in the scanning unit, for detecting the selection indicator and for generating a selection signal in response thereto; and

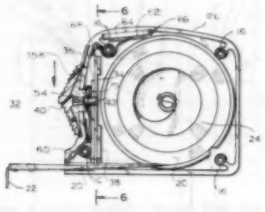
means for generating a control signal in response to the simultaneous generation of the reference signal and the selection signal.

4,462,160

ILLUMINATED LOCKING TAPE MEASURE DEVICE

Howard Cohen, Plainview, and Edward Pakus, East Northport, both of N.Y., assignors to Irwin Measuring Tool Company, Patchogue, N.Y.

Filed Jan. 12, 1983, Ser. No. 457,489
Int. Cl.³ G01B 3/10
U.S. Cl. 33—138 **13 Claims**



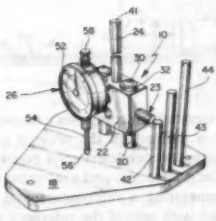
1. In a retractable tape measure including a casing having an opening, a coiled tape rule within said casing having a face with legible indicia thereon and a free end extending through said opening in said casing, means for retracting the tape rule into the casing, and locking means for selectively locking the tape rule in an extended position and releasing the tape rule for retraction into the casing, including an actuator member disposed outside said casing and movable between a unlock position in which said tape rule is released for automatic retraction and a lock position in which said tape rule is locked against retraction; the improvement wherein said tape measure further comprises an electric light device disposed in the casing for illuminating the indicia on said tape rule; power source means within said casing providing electric current to said electric light device; and switch means actuated by said actuator member and connected electrically between said power source and said electric light, to open and close in response to movement of said actuator member to its unlock and lock positions respectively to cause said light to illuminate the indicia on said tape rule when said tape rule is locked in its extended position.

4,462,161

SHUT HEIGHT MEASURING DEVICE

Armand E. Roy, 95 Payson St., Attleboro, Mass. 02703

Filed Jul. 6, 1982, Ser. No. 395,453
Int. Cl.³ G01B 3/30
U.S. Cl. 33—147 R **5 Claims**



1. A device for measuring the shut height of a press of the type having upper and lower press members which are adapted to carry upper and lower material engaging elements wherein at least one of the press members is movable toward and away from the other to effect the corresponding engagement and disengagement of the elements with material interposed therebetween, said device comprising:

(a) a substantially flat base on said lower press member;

(b) a post which extends upwardly and substantially perpendicularly from said base;

(c) a slide member which is slidably mounted on said post and extends a distance therebeyond; and

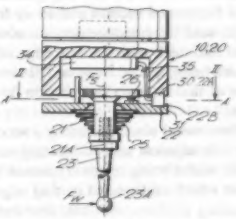
(d) measuring means responsive to movement of said slide member for measuring and indicating the position of said slide member relative to said base, said measuring means being mounted on said slide member and having a plunger portion which engages said base to determine the position of said slide member relative to said base, whereby when said press members are in their shut height positions and said slide member is in engagement with the upper press member, the measurement of said measuring means corresponds to the shut height of said press.

4,462,162

PROBE FOR MEASURING WORKPIECES

David R. McMurtry, Gloucestershire, England, assignor to Rolls-Royce Limited, London and Renishaw Electrical Limited, Gloucestershire, both of, England

Filed Jun. 30, 1982, Ser. No. 393,606
Claims priority, application United Kingdom, Jun. 30, 1981, 8120165
Int. Cl.³ G01B 7/02
U.S. Cl. 33—174 L **8 Claims**



1. A probe for measuring dimensions of a workpiece in coordinate positioning apparatus, comprising a base, a stylus holder having an axis, a support member for supporting the stylus holder, an intermediate member having a fixed region connected to said base and a free region connected to said support member, spring means connected in a state of partial deflection between said holder and said support member to urge the holder into engagement with the support member with a spring force corresponding to said partial deflection, the holder being tiltably and axially displaceable from said engagement in opposition to said spring means and being returnable to said engagement by said spring means when said displacing force ceases, said intermediate member being resilient so as to be responsive via the support member to a displacing force acting on said holder in the sense tending to tilt said holder relative to said base, and further being responsive to a displacing force tending to axially move said holder relative to said base, and sensing means connected between said support member and said base for sensing the occurrence of said displacing forces, and wherein said spring means is of lesser stiffness than said intermediate member.

4,462,163

BOW SIGHT

Lynn A. Tentler, and Paul L. Peck, both of Fond du Lac, Wis., assignors to Total Shooting Systems, Inc., North Fond du Lac, Wis.

Filed Aug. 30, 1982, Ser. No. 412,817
Int. Cl.³ F41G 1/46
U.S. Cl. 33—265 **7 Claims**

1. A bow sight comprising,

a mounting plate adapted to be fixed on a bow so the plane

of the plate is vertical when the bow is used in its usual vertical position,

said mounting plate having a slot therein,

one end of said slot being substantially above the other end of the slot,

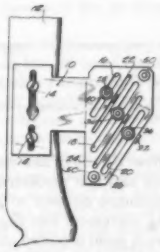
a guide surface parallel to the slot,

a guide plate having a portion engaging said guide surface,

means connected to the guide plate and extending from the guide plate through said slot to project on the other side of the mounting plate, said means including a sight pin,

a lock nut mounted on said means to fix the vertical position of the sight pin in said slot.

5. A bow sight comprising,



a mounting plate adapted to be fixed on a bow so the plane of the plate is vertical when the bow is used in its usual vertical position,

said mounting plate having a plurality of parallel slots therein angled more than 20° relative to the axis of the bow when the mounting plate is fixed to the bow,

a sight pin mounted in each slot by mounting means permitting adjustment of the pin along the length of the slot and transversely of the plate,

said slots being spaced far enough to accommodate said mounting means without interference with or from adjacent mounting means, the angular relationship of said slots to the axis of the bow resulting in and requiring more linear movement of a sight pin in a slot than the desired vertical adjustment of the sight pin.

4,462,164

ORIENTEERING COMPASS

Erik B. Norman, Rusbogatan 12, 77600 Hedemora, and Sven A. Yngström, Svartkällevägen 3, 70375 Örebro, both of Sweden

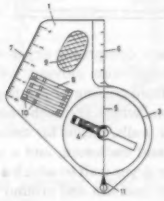
PCT No. PCT/SE82/00005, 371 Date Sep. 3, 1982, 102(e) Date Sep. 3, 1982, PCT Pub. No. WO82/02429, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 11, 1982, Ser. No. 420,227

Claims priority, application Sweden, Jan. 12, 1981, 8100133

Int. Cl.³ G01C *17/02*

U.S. Cl. 33—355 R **8 Claims**



1. An orienteering compass comprising an integral base plate defining a course line, a non-rotatable compass housing on said base plate having a movable north indicator and a transparent base, a stirrup-like holder mounted on said base plate for receiving a thumb inserted therein, such that said base plate and said compass housing can be pressed against and readily secured to a map, said compass housing being arranged with the center of rotation of the north indicator located on the extended course line, a portion of the base plate extending in front of the compass housing, and said stirrup-like holder being arranged on said base plate, such that when pressing said base plate against a map, the thumb passes on the side of the compass housing and makes contact with the portion of the base plate extending in front of the compass housing at a position adjacent the course line.

4,462,165

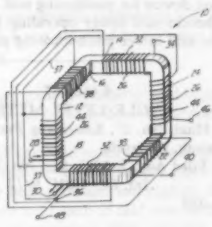
THREE AXIS ORIENTATION SENSOR FOR AN AIRCRAFT OR THE LIKE

Richard W. Lewis, Derby, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 31, 1983, Ser. No. 462,307

Int. Cl.³ G01C *17/28*

U.S. Cl. 33—361 **5 Claims**



4. A three axis orientation sensor for sensing the orientation of an aircraft or the like with respect to the earth's magnetic field, the sensor comprising:

a magnetic permeable core formed in a continuous closed loop, the core including a first X axis leg, a first Z axis leg, a first Y axis leg, a second X axis leg parallel to the first X axis leg, a second Z axis leg parallel to the first Z axis leg, and a second Y axis leg parallel to the first Y axis.

an exciter winding wound clockwise or counter clockwise around the permeable core, the exciter winding wound in a spaced relationship around each of the legs for electrically energizing the core into and out of magnetic saturation;

a first sense winding wound around the two X axis legs'

a second sense winding wound around the two Z axis legs; and

a third sense winding around the two Y axis legs, the first, second and third sense windings receiving individual output signals from the three pair of parallel legs when the core is driven into and out of saturation by the exciter winding.

4,462,166

DEVICE FOR MEASURING LENGTHS AND CONFORMING ANGLES

Stanley J. Furlong, 450 SE. Lacreole Dr., Dallas, Oreg. 97338

Filed Jul. 1, 1982, Ser. No. 394,126

Int. Cl.³ G01B *3/08, 5/02*

U.S. Cl. 33—416 **5 Claims**

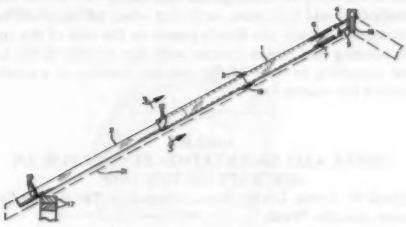
1. A device for measuring lengths and conforming angles comprising:

a. An outer member with, at one end, tracks on the inside of the outer member within which slide an upper pitch locating plate and a lower pitch locating plate with a hingeably connected holding clip;

b. An inner member slideably moveable within the other end of said outer member;

c. Two locking devices located at the midpoint of the outer member and two locking devices located at the other end of said outer member; and

d. An upper operating pin and an upper tightening device for positioning said upper pitch locating plate wherein said



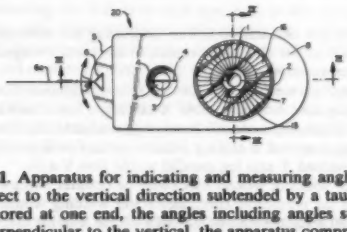
upper operating pin is screwably attached to said upper pitch locating plate and a lower operating pin and lower tightening device for positioning said lower pitch locating plate wherein said lower operating pin is screwably attached to said lower pitch locating plate.

4,462,167

ANGLE/LEVEL METER

David T. K. Huat, No. 27, Kenyalang Park, Chawan Rd., Kuching, Sarawak, Malaysia

Filed Aug. 7, 1981, Ser. No. 291,107
Int. Cl.³ G01C 9/12
U.S. Cl. 33—339 6 Claims



1. Apparatus for indicating and measuring angles with respect to the vertical direction subtended by a taut string anchored at one end, the angles including angles substantially perpendicular to the vertical, the apparatus comprising:

(a) a case dimensioned and sized for being hand-held and having a longitudinal axis;

(b) meter means mounted in said case and having an indicator member for indicating the vertical direction, said meter means including a scale mounted in fixed relation to said case;

(c) means moveably mounted in said case and attached to the unanchored mounted end of the string for sensing the alignment of the string axis;

(d) means associated with said case and said sensing means for determining coincidence between the string axis and said longitudinal case axis, the subtended angle being readable from said scale at said coincidence.

4,462,168

VARIABLE ANGLE STRAIGHT EDGE

Thomas J. Lynch, and John H. Pigman, both of Tempe, Ariz., assignors to International Design Corporation, Phoenix, Ariz.

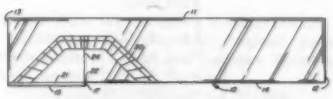
Filed Jun. 27, 1983, Ser. No. 508,246
Int. Cl.³ B43L 7/00
U.S. Cl. 33—492 7 Claims

1. A drafting tool including in combination:

an elongated main body portion having a top and having two ends with at least a first edge thereon spaced a first predetermined distance from the top and extending a portion of the length of said main body portion from one end thereof toward the other end thereof and terminating a second predetermined distance from said one end of said main body portion at a point intermediate the two ends of said main body portion;

a second edge extending from said other end of said main body portion toward said first straight edge and terminating adjacent the point of termination of said first straight edge at a third predetermined distance from the top of said main body portion which is greater than said first predetermined distance and terminating at a fourth predetermined distance from said one end adjacent the point of termination of said first straight edge; and

wherein the end terminations of said first and second edges are interconnected with one another by an offset notch,



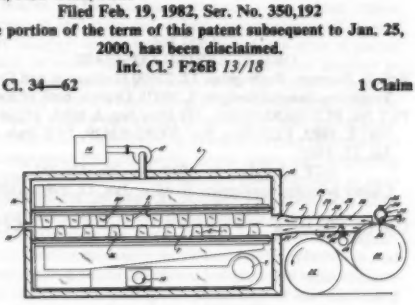
which is spaced from the top of said main body portion at a distance between said first predetermined distance and said third predetermined distance to guide the drawing point of a drafting instrument into engagement with said first edge when such point is placed on a drafting surface and said drafting tool is urged against the point of the drafting instrument by a force parallel to said first straight edge in a direction from said other end of said main body portion toward said one end thereof, thereby permitting rotation of said drafting tool about such drafting instrument and also permitting the striking of a line by such drafting instrument directly from said offset notch along said first edge without necessitating the lifting of such drafting instrument from the drafting surface.

4,462,169

WEB DRYER SOLVENT VAPOR CONTROL MEANS

Robert A. Daane, Green Bay, Wis., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,192
The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.
Int. Cl.³ F26B 13/18
U.S. Cl. 34—62 1 Claim



1. Web drying apparatus comprising dryer walls defining an enclosure wherein a lengthwise moving web is heated for evaporation of solvent from coating or printing on at least one surface thereof and from which the web emerges through a slot in one of said dryer walls, means for maintaining a subatmospheric pressure in said enclosure, and a chill roll spaced outwardly from said one dryer wall to which a straight portion of the web extends from said slot and around which a curved portion of the web is partially wrapped with said one surface adjacent to the chill roll, the boundary between said portions of the web being at a line of tangency, said apparatus being characterized by:

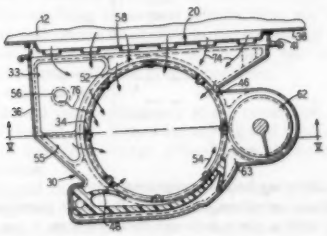
A. nozzle means adjacent to the chill roll, having an outlet from which pressure air issues as a jet;
(1) said outlet being in the form of a slit which
(a) extends lengthwise substantially entirely across the width of the web and
(b) is not substantially wider than is adequate to ensure issuance of pressure air therefrom at a substantially uniform rate all along its length,
(2) said outlet being located and oriented to direct said jet
(a) against said curved portion of the web at a distance of not substantially more than one-half inch from said line of tangency and
(b) substantially radially inwardly relative to the chill roll, and
(3) said outlet being close enough to the chill roll to avoid substantial divergence of the jet before it impinges the web;
B. duct means defining a tunnel extending outward from said one dryer wall and into an inner end of which said slot opens, said duct means comprising a pair to tunnel walls between which said straight portion of the web extends and each of which opposes a surface of the web,
(1) one of said tunnel walls having an outer end near said chill roll that cooperates with the chill roll to define an inlet for air that flows inwardly between said one tunnel wall and said one surface of the web, and
(2) the other of said tunnel walls having an outer end closely adjacent to said nozzle means outlet and serving to guide inwardly along the opposite surface of the web a part of the pressure air that has issued from said nozzle means and has been deflected by the web; and
C. air outlet means arranged to define a plurality of pressure air outlets in the tunnel which are inwardly adjacent to said one tunnel wall and to said inlet, are spaced from one another across the width of that wall, and open towards said inner end of the tunnel, for blowing air inwardly through the tunnel, inducing flow of air through said inlet, and imposing forces upon said one surface of the web that balance the forces imposed upon its said opposite surface by air moving inward through the tunnel from said nozzle means.

4,462,170

SUMP FOR LINT SCREEN CLEANER AND STORAGE SYSTEM FOR A DRYER

Alvin E. Burkall, Coloma Township, Berrien County, and Gerald L. Kretchman, St. Joseph Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 21, 1982, Ser. No. 380,831
Int. Cl.³ F26B *11/02*
U.S. Cl. 34—82 **5 Claims**



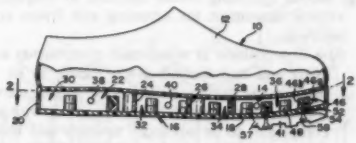
5. For use in an automatic dryer having a lint collecting mechanism comprising:
a lint screen and wiper blade,
a sump positioned adjacent to said lint collecting mechanism to provide a means for removing foreign objects from the area of said mechanism,
said sump having a relatively large top opening and small bottom opening,
wherein air is drawn upwardly through said bottom opening and collected foreign objects fall downwardly through said sump and through said opening.

4,462,171

INFLATABLE SOLE CONSTRUCTION

Louis J. Whispell, 4418 SE. 75th Ave., Portland, Oreg. 97206

Filed May 28, 1982, Ser. No. 383,254
Int. Cl.³ A43B *7/06, 13/20*
U.S. Cl. 36—3 B **6 Claims**



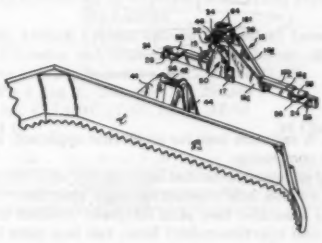
1. A compartmentalized, variable cushioning sole construction in footwear having a top attached to an inner sole, said construction comprising
an outer sole,
a flexible wall structure joining the peripheral edges of said inner and outer soles to form an enclosed space therebetween,
partition means in said enclosed space partitioning the same into fluid-tight inflatable compartments corresponding substantially to the heel, arch and ball regions of a foot,
valve means associated with each of said compartments for inflating the same to a desired fluid pressure independently of the other compartments, and
non-collapse support means distributed as plural free-standing posts in said compartments providing resilient weight support between said inner and outer soles when said compartments are in deflated conditions.

4,462,172

QUICK DISCONNECT BLADE TOOL MOUNTING APPARATUS

Ronald L. Caron, Auburn, Me., assignor to Valley Engineering, Inc., Gray, Me.

Filed Sep. 29, 1982, Ser. No. 428,107
Int. Cl.³ E01H *5/04*
U.S. Cl. 37—231 **10 Claims**



1. Apparatus for detachably connecting a tool component to a vehicle, comprising:
(a) a frame component;
(b) link means connecting said frame component to the vehicle, said link means being adapted to accommodate adjustment of said frame component both vertically and angularly about a horizontal first axis;
(c) first notch means fixedly mounted on one of said compo-

nents and adapted to interengage with first engagement means on the other of said components;

(d) second notch means adjustably mounted on one of said components and adapted to interengage with second engagement means on the other of said components;

(e) first operating means for adjusting said second notch means between an unlocked position opening in a direction transverse to the opening direction of said first notch means, and a locked position opening in a direction opposite to that of said first notch means;

(f) resiliently compressible pad means on one of said components adapted to be compressively engaged by contact means on the other of said components; and

(g) second operating means operable in conjunction with vehicle movement for adjusting said frame component between:

(i) a first position at which said components are spaced apart and said second notch means, in its unlocked position, is facing said second engagement means, thereby permitting the vehicle together with said frame component to be advanced towards said tool component until said second notch means and said second engagement means interengage with each other; and

(ii) an elevated inclined second position at which the tool component is suspended on said frame component, with said first engagement means and said contact means being respectively aligned with and spaced below said first notch means and said resiliently compressible pad means;

(h) said second notch means being operative upon adjustment to its locked position to cause movement of said components relative to each other, resulting in said first engagement means entering into interlocked engagement with said first notch means, with an accompanying compressive engagement of said contact means against said resiliently compressible pad means.

4,462,173

RADIATION BASE OF AN ELECTRIC APPLIANCE

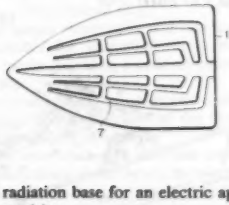
Isao Sato, and Kosaku Nakajima, both of Kamo, Japan, assignors to Toshiba Heating Appliances Co., Ltd., Niigata, Japan

Filed Sep. 28, 1981, Ser. No. 306,230

Claims priority, application Japan, Sep. 26, 1980, 55-134067

Int. Cl.³ D06F *75/38*

U.S. Cl. 38—93 **2 Claims**



1. A radiation base for an electric appliance, said radiation base comprising:

(a) an injection-molded layer formed of a low friction, non-viscous, heat resistant synthetic resin and

(b) a metallic base plate integrally attached to one side of said injection-molded layer, said base plate having a plurality of projections formed on the side thereof to which said injection-molded layer is attached to ensure good conjunction between said base plate and said injection-molded layer, said plurality of projections having bulges in their middles, whereby said injection-molded layer protrudes in between the adjacent surface of said base plate and said bulges in said plurality of projections to further ensure good conjunction between said base plate and said injection-molded layer.

4,462,174

PROCESS AND DEVICE FOR THE TREATMENT OF SCREEN PRINT FABRIC

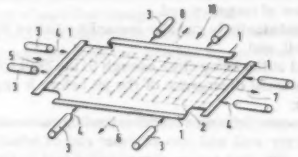
Elmar K. Messerschmitt, Paul-Hösch-Strasse 13, 8000 Munich 60, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 321,133

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042893

Int. Cl.³ D06C *3/08*

U.S. Cl. 38—102.1 **23 Claims**



1. A process for prestretching screen fabric usable in screen printing, comprising the steps in order of:

tensioning said screen fabric to be used in screen printing; and

applying an oscillatory alternating load to said tensioned screen fabric to prestretch said screen fabric.

4,462,175

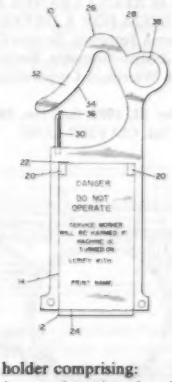
SAFETY TAG HOLDER

Mark W. Romberger, 53 Charlotte St., Manheim, Pa. 17545

Filed Feb. 22, 1983, Ser. No. 468,560

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—10 R **8 Claims**



1. A safety tag holder comprising:

two planar windows, oriented so that their planes are parallel, with a space between them to form a tag holding structure with a pocket for a safety tag;

a hook oriented in the same plane as the windows and attached at one edge of the tag holding structure; and

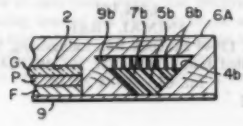
a ring oriented in the same plane as the windows and attached to the backside and below the uppermost part of the hook to permit manipulating the hook by the ring using a fixture on the end of a safety pole.

4,462,176

ARTICLE FOR FORMING A PICTURE FRAME

John R. Schovee, 10 Burr Oak Dr., Pittsford, N.Y. 14534

Continuation-in-part of Ser. No. 193,809, Oct. 3, 1980. This application Apr. 22, 1983, Ser. No. 487,545
Int. Cl.³ A47G 1/06; B32B 31/18
U.S. Cl. 40—154 12 Claims



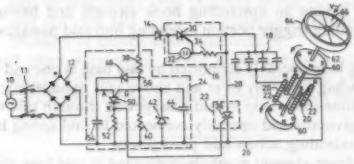
1. An insert for frame molding comprising an elongated main body portion adapted to be received and retained in a groove extended along one surface of said frame molding, means between said main body portion and said groove engaging at least one surface of said groove for frictionally retaining said main body portion in a selected position in said groove.

4,462,177

A.C. CONNECTION CIRCUIT FOR DISPLAY OR INDICATOR

John P. Browne, Georgetown, Canada, assignor to Nel Canada Limited, Toronto, Canada

Filed Dec. 6, 1982, Ser. No. 446,946
Int. Cl.³ G09F 21/04
U.S. Cl. 40—463 12 Claims



1. In combination with a display element designed to move under the control of a reversible magnetic field between two limiting positions which provide mutually contrasting appearances in a viewing direction corresponding to said positions, the position of said display element being controlled by at least one stationery core of reversible permanently magnetizable material the two limiting positions of said display element corresponding to the opposite magnetizations for said core, and a coil corresponding to said at least one core for controlling the magnetization thereof, a circuit comprising:

means for connection of the circuit to an AC supply,

means for rectifying the current received from said supply,

means in said circuit responsive to the connection of said current to said A.C. supply for causing said rectified circuit to magnetize said core in one sense,

at least one capacitor,

means in said circuit responsive to the connection of said circuit to said A.C. supply for causing said rectified current to maintain a charge on said capacitor during said connection,

said charged capacitor having the capacity on discharge through said coil to reverse the magnetization of said core,

a discharge path for the charge on said capacitors through said coil,

switching means for interrupting and connecting said discharge path,

means in said circuit responsive to the connection of said circuit to said AC supply to maintain said discharge path interrupted,

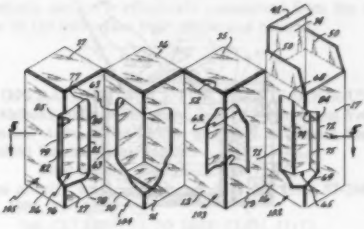
means in said circuit responsive to the disconnection of said circuit from said A.C. supply for causing connection of said discharge path.

4,462,178

DISPLAY STRUCTURE FORMED OF A UNITARY BLANK

Sandra D. Freeman, P.O. Box 943, San Luis Obispo, Calif. 93406

Continuation-in-part of Ser. No. 284,722, Jul. 20, 1981, Pat. No. 4,382,344. This application Jan. 31, 1983, Ser. No. 462,692
Int. Cl.³ G09F 1/08
U.S. Cl. 40—539 5 Claims



1. A structure formed of a unitary blank of sheet material for containing and displaying articles, said structure comprising:

a series of four rectangular boxes;

each said box having the sidewalls thereof formed from body panels defined on said blank;

each of the two middle boxes in the series having diagonally opposite corners thereof respectively joined to a corner of an adjacent box in the series by a joining flap formed by gluing together narrow portions defined on said unitary blank and disposed between two of the body panels forming a joining corner, and each said joining flap having one of its surfaces glued to one of the other two body panels forming the joining corner; and

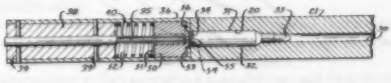
a divider together with a corner viewing window formed for at least one box in the series by providing at least one vertical score line intermediate the top and bottom of each of the adjacent body panels provided on the unitary blank for forming a nonjoining corner of said box and providing a generally horizontally slit between each of the upper and lower ends of said vertical score lines.

4,462,179

CHAMBER ALIGNMENT AND SAFETY SYSTEM FOR A FIREARMS

Michael Rogak, Antioch; Charles Witbeck, Mundelein; Leonard W. Golan, Winnetka, and Stephen L. Golan, Chicago, all of Ill., assignors to Hawk Industries, Inc., Northfield, Ill.

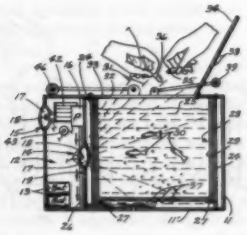
Filed Aug. 6, 1981, Ser. No. 290,606
Int. Cl.³ F41C 11/00, 11/02, 17/00
U.S. Cl. 42—1 Q 14 Claims



1. A self-adjusting head space adapter device for a firearm having a breech portion including a chamber for receiving a cartridge, one end of said cartridge having a primer, and a bolt assembly including a firing pin adapted for striking said primer said head space adapter device being located facing said chamber and comprising: a body, a contact face on said body adapted to bear upon said cartridge end at multiple points surrounding said primer, spring means biasing said body rela-

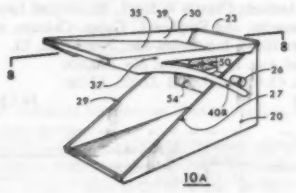
tive to said bolt assembly toward said chamber for causing said body contact face to snugly engage said end and to seat said cartridge in firing position in said chamber, and means aligning said firing pin in striking position with said primer when said contact face is engaged against said cartridge end.

4,462,180
BAIT CONTAINER
Kenneth Scott, R.R. #1, Alden, Iowa 50006
Filed Apr. 16, 1982, Ser. No. 369,075
Int. Cl.³ A01K 97/04
U.S. Cl. 43—57 **13 Claims**



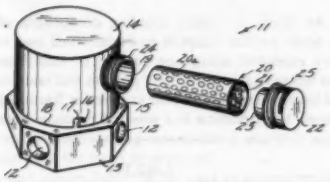
1. An improved bait holding apparatus for fishing comprising:
a housing;
container means disposed within said housing for holding water and fishing bait, said container means including a continuously sealed bottom wall, continuously sealed sidewalls and a top access opening means attached to the top of the sidewalls for providing manual access to bait disposed within said container means, at least a portion of said sidewalls including light transmission means for permitting light to pass therethrough; and
light emitting means attached to said housing adjacent to said light transmission means portion of said container means for directing light rays through said light transmission means portion and into said container means for illuminating the interior of said container means.

4,462,181
DISPOSABLE ANIMAL TRAP
David K. Broman, 4100 Patricia La., Boise, Id. 83704
Filed May 7, 1982, Ser. No. 376,242
Int. Cl.³ A01M 23/18
U.S. Cl. 43—61 **2 Claims**



1. A disposable animal trap comprising:
a bottom member, boxlike in form and having a front opening, and having spring engagement means;
a top member pivotally engaging said bottom member adjacent one end thereof for forming a box-like enclosure in the closed position; said top member including a top plate and a pair of oppositely disposed downwardly depending side walls, at least one of said side walls defining a spring member operable to engage said spring engagement means of said bottom member to bring said top and bottom members into closed apposition when triggered; and
a solid bait trigger member adapted to hold and support said top and bottom members in an open position for entry of an animal and said trigger member operable to cause closure of the members when moved.

4,462,182
ANIMAL TRAP
Roy E. French, 12644 Peacock Rd., Laingsburg, Mich. 48848
Filed Jun. 1, 1982, Ser. No. 383,714
Int. Cl.³ A01M 23/34
U.S. Cl. 43—85 **2 Claims**



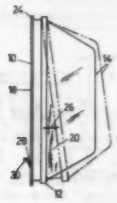
1. An animal trap having plural stations, each station comprising:
a base having a passageway with an open bottom and an outer annular opening to said passageway;
an anti-friction pivotally supported trip connected to said base having an upstanding hook element and having a depending trigger portion extending into said passageway ;
a spring loop operably supported by said base at one end and extending generally over and above said passageway;
a guillotine-snare loop in said passageway through said base and pivotally and operably connected to said spring loop and extending across said passageway;
a hold-down element pivotally connected to said base above said passageway adjacent said outer annular openings and releasably connected to said hook portion of said trip over said depressed spring loop and displaceable upon movement of said trigger portions of said trip thereby freeing said spring loop; and
a cover over said plural stations, said cover having a threaded nipple thereinto and having a perforated tubular removable bait container therein supported in said nipple and a cap matingly engageable over the threaded portion of said nipple.

4,462,183
GARDEN WINDOW WITH HIDE-AWAY SCREEN
Ronald R. Bruhm, 707 Arrow Rd., Weston, Ontario, Canada M9M 2L4
Filed Sep. 13, 1982, Ser. No. 417,229
Int. Cl.³ A47G 7/00
U.S. Cl. 47—40 **2 Claims**

1. A window garden for growing and displaying plants within the space enclosed, and to be positioned over the perimeter wall surface bounding a dwelling house window opening, said window garden comprising in combination;
a fixed frame adapted to be secured to the perimeter wall of a dwelling house window opening; an outwardly moveable frame secured in abuttable and sealable relation to said fixed frame by means of a hinge operable between the top edges thereof;
a predominately transparent enclosure bounded by and perimetrically secured to said moveable frame and projecting outwardly therefrom relative to the fixed frame and dwelling wall surface which immediately surrounds said window opening, said enclosure consisting of a pair of

nesting plastic blister domes spaced apart with dead air therebetween;

means for maintaining an insect excluding relationship between said fixed and moveable frames in any position of said moveable frame relative to said fixed frame comprising, flexible netting fastened continuously between integrally formed clip strips on the perimeter of and facing outwards of said fixed frame, and integrally formed clip strips facing toward the dwelling house wall and formed with the moveable frame, said clip strips being formed on the bottom and side edges of the frames to provide netting coverage to only that area of exposure between the open



frames but not permitting any obscurity to entrance of light to the area covered by the pair of domed blisters composing the enclosure;

a toggle assembly consisting of a rack and screw means rotatable by a handle member fixed to said frame and to a pair of articulated arms attached to the moveable frame and the rack and screw for maintaining the frames in a plurality of spaced apart relationships;

and plant supporting means consisting of a plurality of spaced verticle bars fixed to said fixed frame and holding horizontally disposed shelving therebetween freely within said enclosure.

4,462,184

SYSTEM FOR IMPROVING SYNTHETIC SURFACES

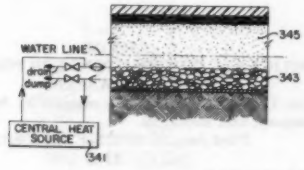
Percy C. Cunningham, 3545 Wellington Crescent, North Vancouver, British Columbia V7R 3B3, Canada

Continuation-in-part of Ser. No. 40,194, May 18, 1979, Pat. No. 4,268,993. This application May 22, 1981, Ser. No. 266,475

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.³ A01G *31/00*; E02B *11/00*

U.S. Cl. 47—58 **22 Claims**



1. A method for preventing extreme high temperatures in the vicinity of synthetic surfaces the method comprising the steps of:

preparing a subgrade area to accommodate a subsurface base system on top of which is applied the synthetic surface, the subsurface base system comprising an upper layer of primarily sand-containing particulate material which has good capillary rise characteristics and in which liquid characteristically moves primarily in the vertical direction, and a lower layer of particulate material located substantially adjacent said upper layer, said lower layer consisting essentially of gravel, in which liquid characteristically moves well in the horizontal direction, as well as downwardly, so that liquid in the lower layer tends to disperse in the horizontal direction relatively rapidly and uniformly, wherein the physical characteristics of the essentially gravel particulate material of said lower layer and the primarily sand-containing particulate material of said upper layer are such that the sand-containing particulate material does not significantly penetrate into the gravel, so that, consequently, the void ratio of the gravel remains substantially unimpaired; and

maintaining the particulate in the upper layer sufficiently moist that the heat insulating effect of the otherwise dry particulate is significantly reduced and so that heat at the synthetic surface is effectively transmitted from the surface to the subsurface base region and beyond.

4,462,185

DOOR OPERATING DEVICE FOR A SLIDE DOOR UNIT

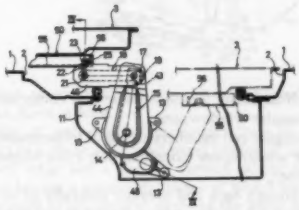
Osamu Shibuki; Shigeru Sakagami, both of Nagoya, and Yoichi Umemura, Anjo, all of Japan, assignors to Toyota Shatai Kabushiki Kaisha, Aichi, Japan

Filed Mar. 8, 1983, Ser. No. 472,862

Claims priority, application Japan, Mar. 12, 1982, 57-39699; Jun. 29, 1982, 57-112007

Int. Cl.³ E05D *15/10*; E05F *15/00, 11/12*

U.S. Cl. 49—218 **6 Claims**



1. In a door operating device for a slide door unit including a wall having an opening formed therein, at least one curved guide rail fixedly extended along said wall and a door slidably associated with said guide rail by means of guide means so that the door is guided to be placed with the outside surface thereof arranged flush with the outside surface of said wall when the door closes the opening of said wall and the door is guided so as to slide along and in parallel to the outside surface of the wall when the door is opened, said door operating device comprising;

a guide member secured to the inside surface of said door and having a plate-shaped engaging flange extending in parallel to the sliding direction of the door;

a first turnable arm supported at the base portion thereof so as to be turnable within a horizontal plane on a stationary portion with respect to said wall;

a driving pulley supported on the base portion of said first turnable arm so as to be rotatable with respect to the first turnable arm;

a second turnable arm supported at the first end thereof on the free end of said first turnable arm with a first shaft so as to be turnable within a horizontal plane;

an intermediate pulley supported rotatably on said first shaft;

a third turnable arm supported at the first end thereof on the second end of said second turnable arm with a second shaft so as to be turnable within a horizontal plane;

a driven pulley rotatably supported on said second shaft;

a driving wheel fixed to said driven pulley so as to be turned together with said driven pulley;

a roller rotatably supported on the second end of said third turnable arm with a shaft extending in parallel to the axis of rotation of said driving wheel and adapted so as to engage with the engaging flange of said guide member and

to receive the engaging flange closely between the roller and said driving wheel;

a prime mover;

a first torque transmitting means for transmitting the torque of the output shaft of said prime mover to said driving pulley; and

a second torque transmitting means for transmitting the rotation of said driving pulley to said driven pulley through said intermediate pulley.

4,462,186

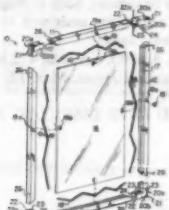
SELF-ADJUSTING WINDOW UNIT WITH CORNER ASSEMBLY

LeRoy C. Fuller, P.O. Box 3564, Logan, Utah 84321

Filed Nov. 22, 1982, Ser. No. 443,593

Int. Cl.³ E06B *3/32, 3/54*

U.S. Cl. 49—463 **3 Claims**



1. A self-adjusting window frame unit comprising

a rectangular windowpane;

four elongate end members arranged to surround the rectangular windowpane extending into a slot formed in an end member;

a pin through each end member centrally of its length and through a hole larger than the pin in the windowpane;

biasing means in the slot of each end member biasing the windowpane from the slot;

corner means at each corner formed by adjacent end members, said corner means including a pair of legs, each having slot means to receive a windowpane edge and to be aligned with slot means in an end member and each leg receiving one end of an end member therein, a common back extending to each leg and opposite side faces projecting from the common back and having edges, each providing a continuation of the common back surface; and

a notch in each end member whereby the end of the end member will fit into a leg of a corner member with the notch fitting inside the back and a surface of the end member being flush with the common back surface.

4,462,187

HEADSETTING STRUCTURE FOR DOUBLE DISC GRINDING MACHINE

Elman R. Dunn, Roscoe, Ill., assignor to Litton Industrial Products, Inc., South Beloit, Ill.

Filed Nov. 19, 1981, Ser. No. 322,987

Int. Cl.³ B24B *5/00, 41/00*

U.S. Cl. 51—111 R **3 Claims**

1. A double disc grinding machine comprising

a wheelhead assembly,

base means for supporting said wheelhead assembly for axial displacement relative thereto, said base means including

a front wall having front trunnion means secured thereto and extending horizontally therefrom, and

a rear wall having rear trunnion means secured thereto and extending horizontally therefrom in coaxial relation with said front trunnion means, and

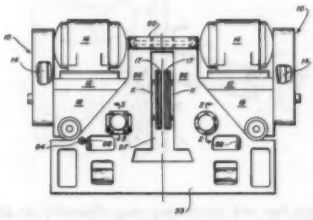
a principal machine frame including front and rear walls, said machine frame rear wall including

means for supporting said rear trunnion means for pivotal displacement about its axis and for limited pivotal displacement about a mutually perpendicular vertical axis, said rear trunnion supporting means comprising

2. a face-to-face mounted pair of ball bearings; and

spacer means having a width selected to locate the bearing load centers of said all bearings coincident on the axis of rotation of said trunnions, and

means for horizontally displacing said rear trunnion supporting means along the rear wall of said machine frame thereby horizontally displacing said rear trunnion means, and



said machine frame front wall including means for supporting said front trunnion means for pivotal displacement about is axis and for limited pivotal displacement about a mutually perpendicular vertical axis, said front trunnion supporting means comprises

a face-to-face mounted pair of ball bearings; and

spacer means having a width selected to locate the bearing load centers of said ball bearings coincident on the axis of rotation of said trunnions

whereby horizontal displacement of said rear trunnion will conjointly cause a pivoting of said front and rear trunnions about vertical axes passing through said points of coincidence thereby effecting a swivel adjustment for said stock removal assembly.

4,462,188

SILICA SOL COMPOSITIONS FOR POLISHING SILICON WAFERS

Charles C. Payne, Aurora, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 21, 1982, Ser. No. 390,726

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—283 R **1 Claim**

1. An improved method for polishing silicon wafers and like materials which comprises applying a polishing agent comprising:

1. An aqueous colloidal silica sol or gel having an average particle size diameter in the range 4–100 millimicrons,

2. A water-soluble amine which contains at least 1 primary amino group and from 2–8 carbon atoms and,

3. A water-soluble quaternary ammonium salt or base containing not more than 6 carbon atoms, and

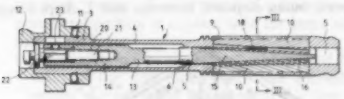
wherein both the amine and the quarternary ammonium salt or base is present at from 0.1–5.0% by weight based on the SiO_2 content of the silica sol; and then, polishing said wafers.

4,462,189

GRINDING TOOL WITH RADIALLY SHIFTABLE ABRASIVE BARS

Guy H. Puybaraud, Courcouronne, France, assignor to S.A. Automobiles Citroen and Societe Automobiles Peugeot, both of Paris, France

Filed Apr. 9, 1982, Ser. No. 367,001
Claims priority, application France, Apr. 17, 1981, 81 08152
Int. Cl.³ B24B *33/02*
U.S. Cl. 51—338 4 Claims



1. A grinding tool comprising:

a generally cylindrical sleeve provided with a plurality of mutually parallel longitudinal slots extending in an axial direction thereof;

a plurality of bars of wedge-shaped outline respectively penetrating said slots, with freedom of radial shifting therein, said bars having abrasive outer faces and sloping inner faces inclined to the axial direction, said bars further having lateral flanks with mortises paralleling said inner faces;

a mandrel axially displaceable in said sleeve and provided with a plurality of sloping guide surfaces, of the same inclination as said inner faces, in contact with the latter; and

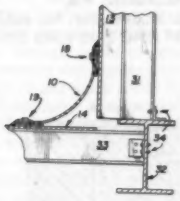
a plurality of ring segments secured to said mandrel in an annular zone thereof with lateral edges respectively projecting above said guide surfaces and engaging in said mortises of the bars respectively in contact therewith for positively shifting said bars upon a displacement of said mandrel in either axial direction.

4,462,190

FLASHING PRODUCT

Ronald J. Allen, Geneva, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 28, 1983, Ser. No. 518,165
Int. Cl.³ E04D *1/36, 3/38;* B32B *3/04*
U.S. Cl. 52—58 12 Claims



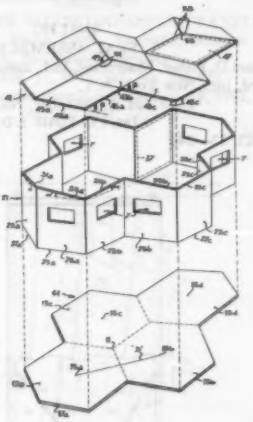
1. A pre-assembled composite flashing product comprising a sheet of generally water resistant resiliently compressible material having a length significantly greater than its width, a pair of thin flat ductile strips, each strip having a width substantially greater than its thickness, to provide a place through which an elongated fastener may be driven, said strips running lengthwise at opposite edges of said sheet, each of said lengthwise edges of said sheet folded over upon itself and substantially enclosing one of said strips, whereby said product can be shaped to conform to a variety of irregular shapes, and sealingly fastened to a structure.

4,462,191

PREFABRICATED DWELLING OF THE MODULAR TYPE

Jacques B. Poirier, Rte. 112, St-Frédéric, Quebec, Canada G0N 1P0

Filed May 3, 1982, Ser. No. 374,619
Claims priority, application Canada, Feb. 25, 1982, 397084
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—236.1 18 Claims



1. Method of constructing a prefabricated dwelling on a selected lot, from at least

a plurality of wall panels, symmetrical two by two with respect to a plane; each wall panel having an upper edge, a lower edge and a pair of vertical edges; each panel further having a trapezoidal shape of which parallel sides correspond to the vertical edges of the panel and at least one non parallel side is inclined relative to the parallel sides and corresponds to the upper edge of the panel, the upper edge having a length L and an inclination angle α, the lower edge having a length L′ and an inclination angle α, such that

$$L \cos \alpha = L' \cos \alpha',$$

a plurality of identical roof panels, each having a lozenge shape having a long diagonal and a short diagonal of which the sides have a length equal to L and an acute angle β, such that

$$\beta = \cos^{-1}\left(\frac{1 - 3\sin^2\alpha}{2}\right)$$

wherein the wall and roof panels all have a structural shape-holding, four cornered frame whereby they may rigidly be assembled to one another, comprising the steps of

(a) providing, on the selected site, adequate foundations and a base suitable to receive the wall panels directly on the foundations, the base having the total shape of a grouping of at least three regular hexagons equal to one another and adjacent at least two by two without all being in alignment, the hexagons having an apothem equal to:

$$\frac{1.732\ L \cos \alpha}{2}$$

(b) mounting the required number of wall panels in symmetry alternation all around the periphery of the base and assembling each wall panel both to the base which sup-

ports it and to the other two wall panels that are adjacent thereto, and wherein the upper edge of adjacent wall panels alternately slope at at angle α downwardly and at an angle α upwardly, and

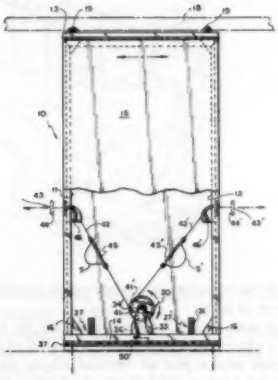
(c) mounting the roof panels on the upper edges of the wall panels in such a manner that their line of slope always merge with their short diagonal, and assembling the roof panels between them in such a way that they form together a self-supporting vault bearing on the wall panels.

4,462,192

SEAL ASSEMBLY

Michael D. Fisher, Moorelend, Ind., assignor to American Standard, Inc., New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,408
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—240 **8 Claims**



1. A shiftable, self-leveling seal assembly arranged and constructed to be housed within a recess of a wall panel, said assembly comprising:

a shiftable member housed within said recess of said wall panel, spring means mounted on said shiftable member for urging said shiftable member out of said recess;

latch means for holding said shiftable member within said recess in a latched, inoperative position; and

a seal actuator means operatively coupled to said shiftable member so that when said shiftable member is moved inwardly of said recess, said shiftable member is automatically urged out of said recess to its extended, operative and self-leveling sealed position.

4,462,193

ELEVATOR CAB

Richard J. Ericson, Southington, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation-in-part of Ser. No. 294,600, Aug. 20, 1981, Pat. No. 4,430,835. This application Jun. 4, 1982, Ser. No. 385,629
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—282 **3 Claims**

1. An elevator cab comprising:

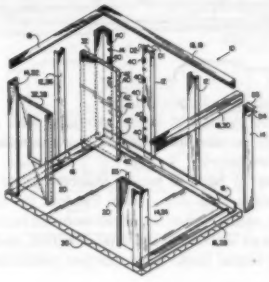
a frame comprising vertical supports and horizontal supports interconnected together, the vertical supports defining the cab walls, the horizontal supports defining the cab floor and ceiling, and characterized by:

panels attached to the frame and comprising paper honeycomb, phenolic resin dipped, that is covered by fire retardant plastic laminate on the side facing the cab interior, and by aluminum on the side facing the shaft,

first fastener assemblies located at vertically spaced apart points between each panel and a vertical support for holding the panels in position on the support, each first fastener assembly comprising hook-like fasteners having two joinable sections, one attached to the panel, the other to the vertical support, and

second fastener assemblies disposed between vertically adjacent first fastener assemblies, for holding the joinable sections in compression, each second fastener assembly comprising a nut embedded in the panel and a bolt that extends through the vertical support into the nut,

said vertical supports comprising channel supports which are U-shaped and L-shaped supports, the L-shaped supports defining the corners of the cab wall, the channel supports being disposed between said L-shaped supports



for defining a cab wall frame between said corners and there being at least two such channel supports for the wall opposite the cab entrance and one channel support between adjacent panels on the same cab wall, said channel support having its widest solid surface facing inward to the cab interior, to which surface said first fastener assembly is attached and through which said bolt extends, and its open end facing the elevator hoistway walls,

each channel support having a flat width ratio of 60 or less, wherein the flat width ratio is equal to the support width over the support thickness, and

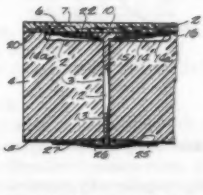
said horizontal supports including L-shaped supports which are attached to each vertical support.

4,462,194

BUILDING PANEL WITH CANTILEVERED RETAINING MEMBERS

Clarence O. Wahner, Brown Deer, Wis., assignor to Sprinkmann Sons Corporation, Milwaukee, Wis.

Filed Jul. 30, 1982, Ser. No. 403,950
Int. Cl.³ E04C *1/00*; E04B *5/00*
U.S. Cl. 52—309.11 **4 Claims**



1. In a building panel having spaced first and second outer layers joined to opposed first and second surfaces, respectively, of an interior core of foam material, the first outer layer having an exposed surface and an inner surface joined to the first surface of the interior core,

the improvement wherein:

(1) the first outer layer is a layer of hardened plastic resin with reinforcing material embedded therein;

(2) the interior core includes a plurality of spaced recesses along its first surface;

(3) a plurality of retention members comprising a plate portion and a retention element extending from an inner surface of the plate portion are arranged within the building panel, with

(a) the plate portion of each retention member abutting the inner surface of the first outer layer, and

(b) the retention element of each retention member extending into the interior core;

(4) a covering patch of reinforcing material extends about the plate portion of each retention member and includes a peripheral portion in contact with the inner surface of the first outer layer,

(a) the covering patch being impregnated with plastic resin of the first outer layer and bonded thereto to secure the retention members to the first outer layer with their retention elements arranged at an angle to the first outer layer,

(b) the plate portion of a retention member and a covering patch associated therewith being received in a recess along the first surface of the interior core such that the outer surface of the plate portion is approximately flush with the inner surface of the first outer layer; and

(5) the second outer layer is a layer of heat reflective metal foil or heat reflective metal foil laminated to paper with the paper joined to the second surface of the interior core.

4,462,195

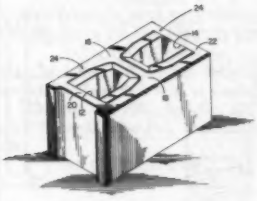
INSULATING INSERT FOR MASONRY BUILDING BLOCK AND METHOD FOR MAKING SAME

David L. Nickerson, 27 Leemond St., Wilbraham, Mass. 01095

Filed Jan. 13, 1982, Ser. No. 339,147

Int. Cl.³ E04B *1/88, 2/08*

U.S. Cl. 52—405 **10 Claims**



1. A preformed insulating insert for a building block having generally parallel top and bottom surfaces and at least one top-to-bottom through cavity of generally rectangular cross section, the generally rectangular cross sectional configuration and dimensions of said block cavity being subject to variation within a significant range during manufacture; said insert being of light-weight cellular heat insulating material and having a flat condition wherein it is generally rectangular with central and similar but opposite side sections connected to the central section by spaced parallel elongated hinge sections, said hinge sections being generally V-shaped in cross section with the hinge adjacent the apex of the V and with the cellular material thereabout of a substantially higher density than that throughout the remainder of the insert, said last mentioned high density condition prevailing with the insert in its flat condition, and said insert being foldable to a generally U-shaped configuration by bending said opposite side sections toward each other along said hinge sections respectively through angles somewhat less than ninety degrees, said V-shaped hinge sections being so shaped as to provide resistance to a full ninety degrees bending movement of said side sections toward each other, the free folded condition of the insert thus having the side sections inclined slightly outwardly in the U-configuration so as to be further bent toward each other for insertion in said block cavity and thereafter to expand or spring toward their free condition and frictionally grip the sides of the block cavity for retention therein.

4,462,196

MEANS FOR INTERCONNECTING PANELS

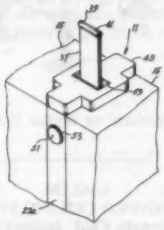
Peter C. Freiberg, South Perth, Australia, assignor to P.C. Freiberg Pty. Ltd., Bayswater, Australia

Filed Jun. 17, 1982, Ser. No. 389,472

Claims priority, application Australia, Jun. 18, 1981, PE9348

Int. Cl.³ F04C *1/10*

U.S. Cl. 52—586 **14 Claims**



1. Means for interconnecting adjacent panels of partitioning comprising a flanged member adapted to be secured to or formed integral with the vertical edges of each panel, each flanged member being provided with one or more flanges which mate with corresponding flanges of the flanged member of an adjacent panel to prevent separation of the adjacent panels along the line of the panels, each flanged member also being provided with an open longitudinal channel adapted to abut with a similar open longitudinal channel on the flanged member on the adjacent panel to define a closed channel when in the mating position and a locking strip adapted for insertion in the closed channel to prevent separation of the flanged members in a direction substantially at right angles to the line of the panels and a cap for positioning at one end of the mating flange members, said cap comprising a body having means for engaging the flanged members to prevent relative movement therebetween parallel to the longitudinal axis of the mating flanged members, and an opening in the body adapted to align with said closed channel to permit insertion and withdrawal of the locking strip.

4,462,197

SHORING SYSTEM AND PARTS THEREOF

Michael S. D'Alessio, Flushing, N.Y., and Robert S. Safier, Hackensack, N.J., assignors to Harsco Corporation, Camp Hill, Pa.

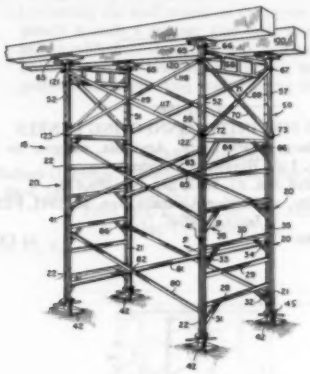
Filed Sep. 10, 1980, Ser. No. 185,761

Int. Cl.³ E04G *1/14, 1/12, 5/00*

U.S. Cl. 52—637 **20 Claims**

1. Extension leg for use as part of an extendable shoring system, said leg comprising a cylindrical tube defining a hollow core and having a plurality of locating holes at spaced intervals along the length of said leg, said leg having at least one longitudinally extending wall portion of an increased thickness sufficient when said leg is under load to support at least one of a plurality of support pins in at least one locating

hole formed transversely through said leg in said thickened wall portion and off-set from said core, said leg being formed



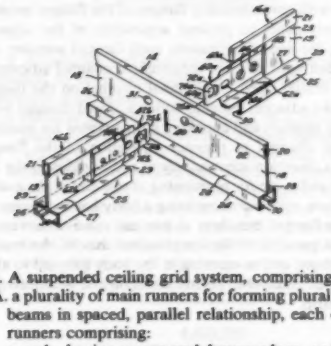
of aluminum, magnesium, or similar lightweight extrudable material.

4,462,198

SUSPENDED CEILING SYSTEM

Joseph F. Sharp, Norwalk, Calif., assignor to Ceiling Dynamics, Inc., Tucson, Ariz.

Filed Apr. 3, 1981, Ser. No. 250,583
Int. Cl.³ E04C 2/42
U.S. Cl. 52—667 **2 Claims**



1. A suspended ceiling grid system, comprising:

A. a plurality of main runners for forming plural longitudinal beams in spaced, parallel relationship, each of said main runners comprising:

a web, having upper and lower edges, and a vertical, rectangular slot therethrough; and

a main runner support flange, connected to the lower edge of said web, having a support surface extending perpendicularly from said web;

B. a first cross runner for interconnecting a pair of adjacent longitudinal beams, comprising:

a web, having upper and lower edges and

a cross runner support flange connected to the lower edge of said web, having a support surface extending perpendicularly from said web; and

C. a first end connector, mounted on and extending from one end of said web, at least a portion of which is sized to pass through said rectangular slot to connect said cross runner to one of said main runners, said first end connector including a flange formed thereon and projecting laterally therefrom, said flange bears against the cross runner support flange with at least a portion of said lateral flange oriented to bear against said main runner support flange when said first end connector is mounted on the cross runner and the cross runner is connected to said main runner, to support said cross runner on said main runner, with said cross runner support flange abutting said main runner support flange, and said support surfaces lying in a common plane throughout their length; and

D. a second cross runner, having a second end connector;

first means, on said end connector, for engaging said second end connector;

second means, on said second end connector, for engaging said first end connector; and

said first and second means interlocking said end connectors when said end connectors are inserted into said main runner slot from opposite directions to prevent movement of said cross runners away from each other independent of said main runner web;

wherein said first and second means each comprise:

a T-shaped tongue having a pair of trailing edges; and

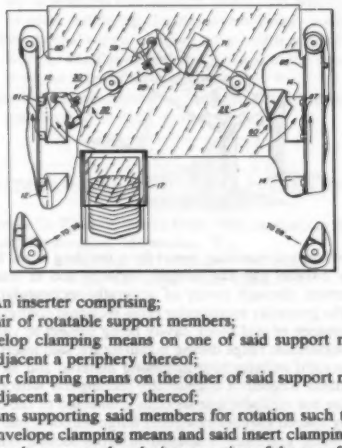
a pair of protrusions formed on the end connector, oriented to engage and be engaged by the trailing edges of the opposing end connector when said end connectors are inserted into said main runner slot from opposite directions a sufficient distance to permit the T-shaped tongue portion to slide past the protrusions, whereby withdrawal of either end connector from the slot is resisted by the end connector protrusions.

4,462,199

ROTARY INSERTER

Neil A. Polit, Crystal Lake, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 13, 1981, Ser. No. 292,570
Int. Cl.³ B65B 5/00
U.S. Cl. 53—266 A **7 Claims**



1. An inserter comprising;

a pair of rotatable support members;

envelop clamping means on one of said support members adjacent a periphery thereof;

insert clamping means on the other of said support members adjacent a periphery thereof;

means supporting said members for rotation such that said envelope clamping means and said insert clamping means overlap one another during a portion of the arc of rotation of said members in an insert area;

means to supply an envelope to said envelope clamping means at a point in the rotational arc of the member supporting said envelope clamping means remote from said insert area;

means to supply at least one insert to said insert clamping means at a point in the rotational arc of the member supporting said insert clamping means remote from said insert area;

means for actuating said envelope clamping means and said insert clamping means to grasp the envelope and insert provided thereto;

means for rotating said members in opposite directions so

that said envelope and insert clamping means bring said envelope and insert into overlapping relation as said envelope and insert clamping means pass through said insert area;

envelope spreading means to spread said envelope for receipt of said insert upstream of said insert area;

said insert and said envelope having substantially planar configurations prior to spreading of said envelope and being in substantially coplanar relationship with one another and substantially parallel with the planes of the rotational arcs of the clamping means on the support members while in the insert area;

means to transfer said insert from said insert clamp means following disposition of said insert in said envelope;

means to inactivate said envelope spreading means to enable said envelope to close; and

means to release said envelope clamping means and discharge said envelope together with said insert.

7. The method of placing a planar insert into a planar envelope in a uniform non-reciprocatory motion and without substantial vibration, the steps which comprise:

(a) grasping an envelope;

(b) grasping an insert to be inserted into the envelope;

(c) moving said envelope and insert along separate but converging rotary paths so that said envelope and insert are momentarily in a common plane substantially containing the planar bodies of said envelope and said insert with said common plane being parallel with the planes of the rotary paths;

(d) as said envelope and said insert near each other, spreading said envelope apart to permit insertion of said insert;

(e) while said envelope and said insert are in said common plane, inserting said insert into said envelope ; and

(f) before said paths re-converge, releasing said envelope with said insert therewithin before grasping the next envelope and insert.

4,462,200

METHOD AND DEVICE FOR THE REMOVAL OF THE SUCTION TUBE OF A GLASS-FILLED FINAL STORAGE CONTAINER

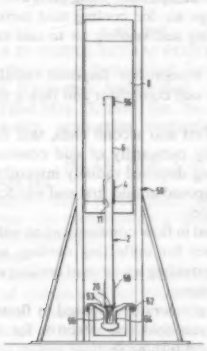
Detlef Stritzke, Mol, Belgium, assignor to Deutsche Gesellschaft fur Wiederaufarbeitung, Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,306

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022387

Int. Cl.³ B65B *1/04, 3/00*

U.S. Cl. 53—467 **16 Claims**



1. A method for disposing of a suction tube connected to a storage container for radioactive waste and encapsulating glass which comprises

(a) providing a sleeve in the bottom of said container projecting up into said container with said suction tube slidably mounted therein and a heat-sensitive metal connector between said sleeve and said tube disposed above said bottom inside the container,

(b) causing said connector to break by passing molten glass through said tube gradually to heat the connector to the point where it breaks under the weight of said container,

(c) rigidly supporting the lower end of said tube so that the tube pushes up into said container as the container moves downwardly to the lower end of said tube, whereby the tube is completely enclosed within the container, and

(d) sealing said container bottom in the area below said sleeve and tube.

4,462,201

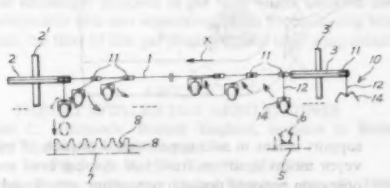
METHOD AND APPARATUS FOR DISCHARGING OBJECTS FROM HOLDERS

Tatsuo Nambu, c/o Nambu Electric Co., Ltd., 55, Kisshoin Ikenouchi-cho, Minami-ku, Kyoto, Japan

Filed Nov. 14, 1980, Ser. No. 206,952

Int. Cl.³ B65B *23/02, 23/08, 5/10*

U.S. Cl. 53—475 **17 Claims**



14. A method of transporting objects from a first station to a fixed second station and discharging said objects at said second station, each of said objects being transported by a respective holder moving at a first velocity between said stations, and comprising the steps of:

accelerating each of said objects from said first velocity to a second velocity of substantially zero relative to said second station during approach of each object to said second station; and

discharging each of said objects at said second station when said second velocity is achieved such that said objects are successively placed gently at said second station.

4,462,202

APPARATUS FOR FORMING LIQUID FILLED PACKAGES

Wilhelm Reil, Bensheim-Auerbach, Fed. Rep. of Germany, assignor to Tetra Pak Development, S.A., Fed. Rep. of Germany

Continuation of Ser. No. 198,161, Oct. 17, 1980, abandoned. This application Apr. 14, 1983, Ser. No. 484,004

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1979, 2942117

Int. Cl.³ B65B *6/24*

U.S. Cl. 53—526 **1 Claim**

1. Apparatus for shaping liquid-filled packages of plastic laminated cardboard carrier material at a shaping head of a packaging production line said material being produced from a hose shaped base having transverse and longitudinally oriented sealing means, comprising:

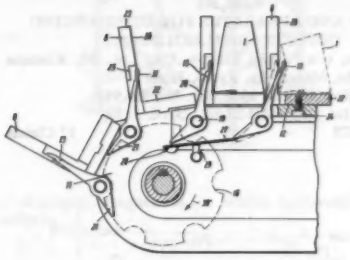
(a) conveyor means for transporting and supporting a series of sequentially arranged packages along a conveyor path to said shaping head, said conveyor means comprising a chain belt movable through an upper strand portion, a lower strand portion and two curved transition zones between said upper and lower strand portions and carrying a plurality of angle plates support means, said angle plate support means having a lower arm which is horizontal in the upper strand portion of said conveyor and an upper arm substantially perpendicular to said lower arm

protruding outward from said chain belt behind the packages, each said upper arm having a recess therein;

(b) said shaping head comprising a shaping means operative to press and shape the liquid-filled packages;

(c) plunger means movably mounted on each said support means to compress and reduce the volume of one liquid-filled package while the shaping means (b) presses and shapes the one liquid filled package;

(d) each said plunger means comprising of lever means having a control arm extending out of the path of the packages and a second arm integral with and at a fixed angle to said control arm, said second arm residing in a rest position within said recess of said upper arm of said



support means in said upper strand portion of said conveyor means upstream from said shaping head and in an operation pressing position protruding out of said recess;

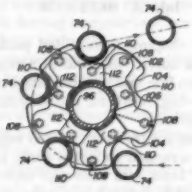
(e) a sequence switch cam plate longitudinally extending in the direction of movement of the packages proximate said shaping head, the upstream longitudinal end of said cam plate pivotally mounted on an axle, said cam plate being spring loaded and supported by a pin downstream from said pivot point, said cam plate positioned to engage said control arm of said lever means as said support means moves along the cam plate to forwardly move said second arm of said plunger from said recess to a package engaging and pressing position at a location on said upper strand proximate said shaping head.

4,462,203

SPROCKET-SHAPED MEMBER FOR SUPPORTING APRON TUBES IN ROLL BALING MACHINE

Stephen C. Schlotterbeck, New Holland; Francis L. Uhland, Jr., Narvon; Willis R. Campbell, Ephrata, and John H. Freimuth, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Sep. 3, 1982, Ser. No. 414,753
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **5 Claims**



1. In a roll baling machine having a frame, an apron movably supported on said frame to form a roll bale of crop material, said apron moving in a predetermined direction and along a predetermined path during formation of said roll bale said apron including endless flexible members and transverse members extending between and interconnecting said endless flexible members, the improvement comprising:

a sprocket-shaped member rotatably carried on said frame for supporting said transverse members intermediate said endless flexible members in an area where said transverse members are coming into contact with said roll bale when said apron is moving in said predetermined direction and along said predetermined path; and

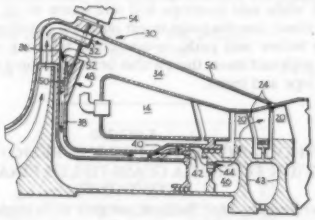
said sprocket-shaped member having notches for receiving said transverse members.

4,462,204

GAS TURBINE ENGINE COOLING AIRFLOW MODULATOR

Peter R. Hull, Ipswich, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Jul. 23, 1982, Ser. No. 401,173
Int. Cl.³ F02C *7/12*
U.S. Cl. 60—39.07 **4 Claims**



1. In a gas turbine engine including a centrifugal compressor, a combustor, and a turbine section being coaxially disposed in an engine casing, said compressor being disposed forward of said combustor and said turbine section being disposed aft of said combustor, said compressor being effective for supplying compressor discharge air for cooling said turbine section, a system for modulating said cooling air to said turbine section comprising:

an outlet of said compressor disposed radially outwardly with respect to said combustor and facing in an aft direction;

a duct having a first and second ends, said first end being disposed radially outwardly of said combustor and said second end being disposed radially inwardly thereof, and an inlet port disposed at said first end and forward of said compressor outlet;

a manifold disposed in flow communication with said second end of said duct for collecting cooling air discharged therefrom for providing a source of cooling air for cooling said turbine section;

a tangential flow accelerator disposed in flow communication with said manifold and effective for directing said cooling air to said turbine section; and

valve means effective for modulating flow of said cooling air in said duct and including an actuator disposed radially outwardly of said casing, an actuator arm extending from said actuator through said casing, and a valve positionable in said duct for modulating airflow therethrough and being operatively connected to said actuator arm.

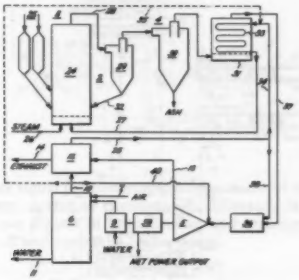
4,462,205
INTEGRATED COAL-FIRED GAS TURBINE POWER PLANT

Walter B. Giles, Scotia, and Norman J. Lipstein, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 69,775, Aug. 27, 1979. This application Jun. 22, 1981, Ser. No. 276,434

Int. Cl.³ F02C 3/26

U.S. Cl. 60—39.02 4 Claims



1. An apparatus for the utilization of coal comprising:
a coal combustion system including a pressurized fluidized bed combustor for producing a hot motive effluent;
a gas cleanup segment in flow communication with said pressurized fluidized bed combustor, said cleanup segment receiving said motive effluent;
an expansion turbine receiving said motive effluent from said gas cleanup segment;
means for substantially isothermally producing pressurized fluid in flow communication with said coal combustion system, including a hydraulic compressor and a regenerator connected intermediate said hydraulic compressor and said coal combustion system, said regenerator being in heat exchange relationship with the exhaust of said expansion turbine; and
means for supplying a flow of fluid from said pressurized fluid producing means to said gas cleanup segment, said flow supplying means passing in heat exchange relationship through a segment of said coal combustion system to absorb heat prior to reaching said gas cleanup segment.

4,462,206
GAS TURBINE-STEAM POWER PLANT

Emile Aguet, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

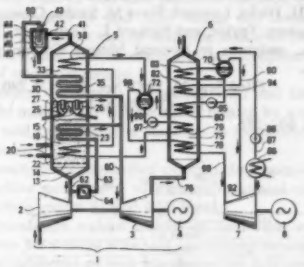
Filed May 17, 1982, Ser. No. 379,138

Claims priority, application Switzerland, Jun. 10, 1981, 3791/81

Int. Cl.³ F02C 3/26

U.S. Cl. 60—39.182 12 Claims

1. A gas turbine-steam power plant comprising
a compressor for compressing a flow of combustion air passing therethrough;
a gas turbine;
a pressure vessel having an air distribution box for receiving a flow of compressed air from said compressor and a combustion chamber for a fluidized combustion bed downstream of said distribution box;
a separating means in the flow of gas between said combustion chamber and said gas turbine;
an exhaust steam generator connected to said gas turbine to receive a flow of expanded gas therefrom;
an evaporator-heating surface disposed within said combustion chamber for conveying a working medium therethrough in heat exchange relation with the flow of gas;
a recuperator disposed in the flow of gas between said combustion chamber and said separating means, said recuperator having an inlet to receive a flow of gas from said separating means and an outlet connected to said turbine to deliver a flow of gas to said turbine; and



a heat exchanger disposed in the flow of gas between said recuperator and said separating means for removing heat from the flow of flue gas passing to said separating means.

4,462,207
THRUST SPOILER FOR AERO ENGINES

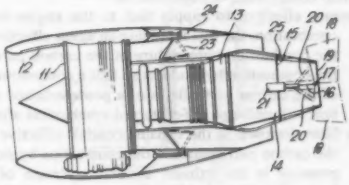
Malcolm C. Hitchcock, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 6, 1981, Ser. No. 251,339

Claims priority, application United Kingdom, Apr. 30, 1980, 8014331

Int. Cl.³ F02K 1/60, 1/72, 3/06

U.S. Cl. 60—204 11 Claims



1. A gas turbine engine of the by-pass type comprising:
a fan mounted in a by-pass duct for producing a by-pass flow of pressurized air;
a thrust reverser which, then deployed obturates the by-pass duct and reverses the propulsive thrust produced by the by-pass flow;
a core engine comprising a compressor, a fuel combustor, turbine means for driving the fan and the compressor and a jet pipe defining a first outlet nozzle;
a thrust spoiler for reducing the propulsive thrust produced by an efflux of hot gasses from the turbine means through the jet pipe, the spoiler comprising a structure which is positioned and arranged relative to the jet pipe so that in a first position it defines a rearward extension of the jet pipe and a second nozzle having a smaller cross-sectional outlet area than a cross-sectional outlet area of the first nozzle, the structure being movable to a second position where it exposes the first nozzle and being so constructed and arranged to cause air pressure immediately downstream of the turbine means to be reduced compared to air pressure immediately downstream of the turbine means when the structure is in the first position such that at least the fan and turbine means speed up to increase the by-pass flow; and

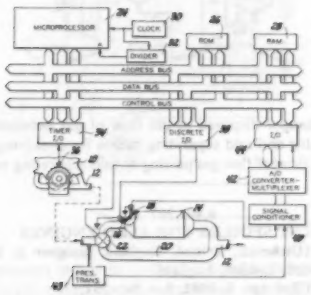
actuator means operable to deploy the thrust reverser when the thrust spoiler is deployed in the second position.

4,462,208

REGENERATION CONTROL SYSTEM FOR A DIESEL ENGINE EXHAUST PARTICULATE FILTER

Robert H. Hicks, Leonard; Steve M. Senko, Clawson; Roland J. Budenaers, Taylor, and Richard L. Teno, East Detroit, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 23, 1982, Ser. No. 421,780
Int. Cl.³ F01N 3/02
U.S. Cl. 60—286 **1 Claim**



1. An exhaust purifying system in combination with a diesel engine having an exhaust conduit into which combustion by-products including carbon particulates are discharged, the system comprising, in combination:

means effective to supply fuel to the engine to undergo combustion, the fuel including an agent effective to lower the combustion temperature of the carbon particulates in the combustion byproducts so that a concentrated deposit of the carbon particulates of a predetermined concentration will undergo self-sustained combustion after ignition;

a filter disposed in the exhaust conduit effective to collect the carbon particulates in the combustion byproducts, the pressure in the exhaust conduit upstream of the filter having a value related to the concentration of the carbon particulates collected by the filter and to the flow rate of the combustion byproducts;

circuit means responsive to a predetermined engine operating parameter representative of the flow rate of the combustion byproducts effective to provide a schedule of values of pressure in the exhaust conduit upstream of the filter that represents a collection of carbon particulates at the predtermined concentration;

means effective to measure the predetermined engine operating parameter;

means effective to measure the pressure in the exhaust conduit upstream of the filter;

ignition means effective to ignite the carbon particulates collected by the filter at least at one point on the filter when the measured pressure is equal to the scheduled pressure at the measured engine operating parameter to regenerate the filter through self-sustained combustion of the carbon particulates; and

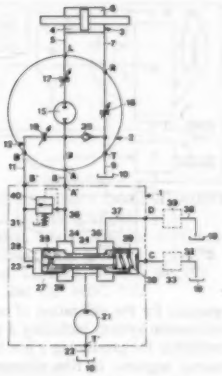
means effective to inhibit the ignition means from igniting the carbon particulates for a predetermined time period following each ignition of the carbon particulates, the time period allowing the particulates to accumulate to the predetermined concentration in all areas of the filter in the event self-sustained combustion did not occur resulting in partial regeneration of the filter.

4,462,209

HYDRAULIC CONTROL MEANS, PARTICULARLY STEERING MEANS

Svend E. Thomsen, Nordborg, and Erik Kyster, Augustenborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 22, 1982, Ser. No. 351,112
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107915
Int. Cl.³ F16H 39/46
U.S. Cl. 60—384 **8 Claims**



1. Hydraulic control means for a steering unit servo-motor, comprising, pressure medium supply means having a pump, a regulating valve connected to said pump having a valve body forming oppositely acting steering and consumer throttling, said valve body having a fixed size control throttle, tank means, a control unit having an actuating element and a metering motor, said control unit having neutral position spring means and two throttle valve elements adjustable relatively to each other against the force of said means in response to oppositely acting effects of said actuating element and said metering motor, a first throttle controlled by said valve elements disposed between said metering motor and said servo-motor, a second throttle controlled by said valve elements between said servo-motor and said tank means, a third throttle controlled by said valve elements disposed in a branch leading to said regulating valve from a point upstream of said metering motor, said first and second throttles being closed when said third throttle is open in the neutral position, said third throttle being in series with said regulation valve body fixed size throttle whereby said regulating valve is acted upon depending on the pressure upstream and downstream of said fixed throttle.

4,462,210

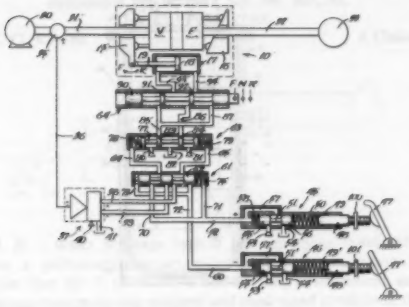
INPUT TORQUE CONTROL FOR A VARIABLE DISPLACEMENT HYDRAULIC TRANSMISSION

Frederic W. Pollman; Jimmy W. Bolinger, both of Ames, and David W. Reynolds, Huxley, all of Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 31, 1981, Ser. No. 288,988
Int. Cl.³ F16H 39/46
U.S. Cl. 60—444 **10 Claims**

1. A torque control for a drive system having a fixed speed prime mover connected to a hydraulic transmission which can perform in driving and braking modes and having a pair of interconnected hydraulic displacement devices with at least one of said devices having variable displacement comprising, means for generating a torque signal representative of prime mover output torque which is the input torque to the hydraulic transmission, torque demand generating means for generating a first torque demand signal for a driving mode and a second

torque demand signal for a braking mode, means for comparing the prime mover output torque signal and a torque demand signal and generating a control signal, and means responsive to



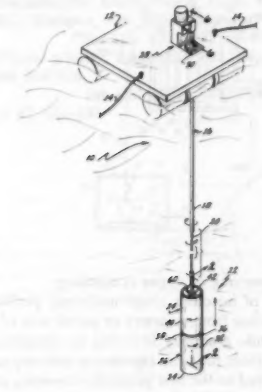
said control signal for controlling displacement of the variable displacement device to eliminate any difference in said compared torque signals in both driving and braking modes of operation of said hydraulic transmission.

4,462,211

APPARATUS FOR HARVESTING WAVE ENERGY

Hal R. Linderfelt, 5540-A Avenida Soseiga, Laguna Hills, Calif. 92653

Filed Jul. 8, 1983, Ser. No. 512,012
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—501 16 Claims



1. A wave energy harvesting apparatus which comprises:

a float means located near the surface of a body of water, said float means rising and falling in response to the passage of waves across said surface of said body of water;

a vertically oriented hollow tube means having ends, said tube means located in said body of water below said float means with said ends of said tube means located at a water depth sufficiently below said surface of said body of water so as to be essentially isolated from vertical water movement associated with said waves moving across the surface of said body of water, said water at said depth capable of flowing within said tube means by both water movement from the lowermost end of said tube means toward the uppermost end of said tube means and from the uppermost end of said tube means to the lowermost end of said tube means;

connecting means extending between said tube means and said float means, said connecting means connecting said tube means to said float means so as said float means rises and falls in response to passage of waves across said surface of said body of water said tube means is raised and lowered in said body of water at said depth to force said water flow within said tube means upwardly from the lowermost of the ends of said tube means to the uppermost end of the ends of said tube means in response to downward movement of said float means and downwardly from the uppermost end of said tube means to the lowermost end of said tube means in response to upward movement of said float means;

turbine means operatively associated with and located in said tube means, said turbine means rotated by water flow within said tube means in response to movement of said float means;

said connecting means further operatively associated with said turbine means so as to transmit rotational motion of said turbine means to said float means;

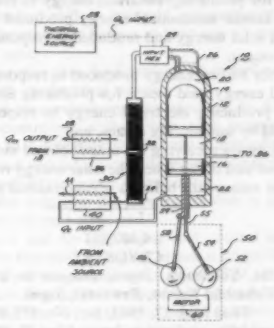
energy translation means located on said float means in operative association with said connecting means so as to receive rotational motion transferred by said connecting means from said turbine means, said energy translation means translating the kenetic energy of said rotational motion received from said connecting means to a useful alternate form of energy.

4,462,212

UNITARY HEAT ENGINE/HEAT PUMP SYSTEM

Stelian Knoos, 5933 Avenida Chamnez, La Jolla, Calif. 92037

Filed Dec. 30, 1981, Ser. No. 335,659
Int. Cl.³ F25B *9/00*; F02G *1/04*
U.S. Cl. 60—526 21 Claims



1. A heat driven heat pump system comprising:

a thermodynamic system having a cold chamber, a hot chamber and an intermediate working chamber, a working fluid within the chambers, regenerator means intercoupling the hot and cold chambers to establish a thermal gradient therebetween, means coupled to said hot and cold chambers for varying the volumes thereof in cyclic fashion to induce pressure and temperature changes in the working fluid in the hot and cold temperature chambers respectively, and means intercoupling the hot chamber and regenerator means for adding thermal energy to the working fluid; and

heat exchanger means coupled to the intermediate working chamber and a selected intermediate region of the regenerator means for extracting thermal energy from the working fluid thereat;

wherein the pressure ratio between maximum and minimum pressures in the working fluid is between 1.1 and 1.5 and the ratio of the absolute temperatures of the hot and cold chambers is in excess of 1.5, such that an ambient source contributes heat to working fluid at the cold temperature

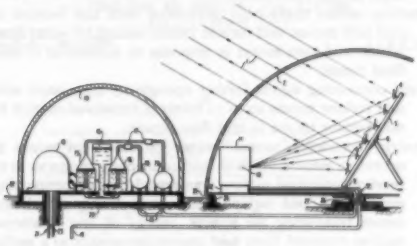
and the coefficient of performance between the thermal input at the hot chamber and the output at the intermediate working chamber is in excess of 1.4.

4,462,213

SOLAR-WIND ENERGY CONVERSION SYSTEM

Arlin C. Lewis, Box AU, Libby, Mont. 59923

Division of Ser. No. 079,009, Sep. 26, 1979, Pat. No. 4,311,011.
This application Oct. 16, 1981, Ser. No. 311,814
Int. Cl.³ F03D *9/02*; F03G *7/02*
U.S. Cl. 60—641.8 **7 Claims**



1. In combination:

boiler means responsive to input solar energy for producing steam;

means for producing kinetic mechanical energy in response to wind movement;

means receiving said steam and producing kinetic mechanical energy;

means for producing electrical energy in response to both said kinetic mechanical energy produced in response to input solar energy and produced in response to said wind movement;

means for storing energy produced in response to said electrical energy, said means for producing electrical energy also producing electrical energy in response to energy stored by said storing means, and

heating means receiving the output of said means for storing to heat said boiler when the solar energy received by said boiler means falls below a predetermined level.

4,462,214

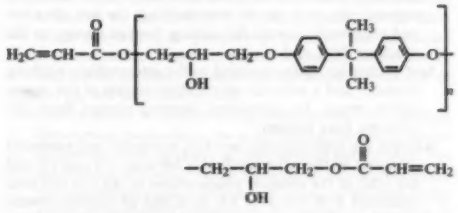
CRYOSTAT

Daisuke Ito, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

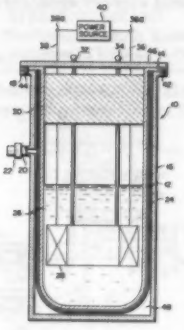
Filed May 17, 1982, Ser. No. 379,090
Claims priority, application Japan, May 20, 1981, 56-74845
Int. Cl.³ F17C *1/00*
U.S. Cl. 62—45 **6 Claims**

1. A cryostat for storing cryogenic fluid, comprising:

an inner tank to be in contact with a crogenic fluid and formed of fiber-glass reinforced vinyl polyester resin, wherein said vinyl polyester resin is formed from monomers represented by the formula:



wherein n is 1 to 4; and



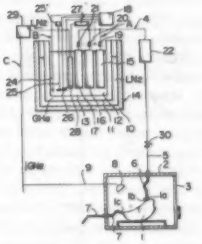
an outer tank surrounding said inner tank.

4,462,215

METHOD OF PRESERVING ORGAN AND APPARATUS FOR PRESERVING THE SAME

Yasuo Kurosoka, and Nobuo Sakao, both of Sapporo, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Filed May 31, 1983, Ser. No. 499,220
Int. Cl.³ F24F *3/16*
U.S. Cl. 62—78 **2 Claims**



1. A method of preserving an organ comprising:

first perfusing step of injecting blood uniformly perfusing liquid such as choline from an artery or portal vein of the excised organ while gradually lowering its temperature and exhausting it from the vein, continuing said step until the liquid is lowered to the first proximity lowering temperature before its solidifying temperature,

second perfusing step of perfusing refrigerating defect preventing agent such as dimethyl sulfoxide or glycerin instead of the blood uniformly perfusing liquid while gradually lowering its temperature from the first proximity lowering temperature, continuing said second step until the agent becomes the second proximity lowering temperature before its solidifying temperature,

third perfusing step of perfusing the final perfusing liquid of low solidifying temperature lower than the agent such as alcohol or ether instead of the agent while gradually lowering the liquid from the second proximity lowering temperature, continuing said third step until the liquid becomes the third proximity lowering temperature before its solidifying temperature, or until the liquid is frozen, and

preserving the frozen organ thus obtained in the frozen state.

4,462,216

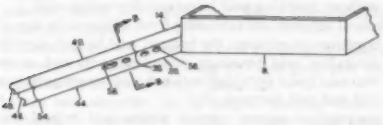
NON-FREEZE DRAIN ASSEMBLY

Daniel E. Kramer, 2009 Woodland Dr., Yardley, Pa. 19067

Continuation of Ser. No. 114,378, Jan. 21, 1980, abandoned. This application Feb. 4, 1982, Ser. No. 345,782

Int. Cl.³ F25D *21/00*

U.S. Cl. 62—80 **6 Claims**



3. In a water drainage system for conveying condensate from a refrigerating evaporator through an environment cooler than 32° F. (0° C.) to a non-freezing environment, said drainage system having plugged and unplugged conditions, the method of ensuring free flow from the evaporator during both plugged and unplugged conditions comprising the steps of:

(a) establishing a first flow path from the evaporator to the non-freezing environment for flow during unplugged conditions;

(b) establishing within the cold environment a heated second flow path for flow during plugged conditions.

4,462,217

PROCESS AND APPARATUS FOR THE CONTROL OF A VOLUME OF FLUID MOVING THROUGH A DUCT SYSTEM

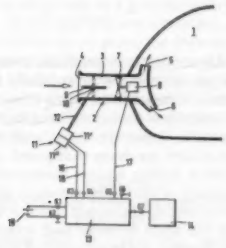
Werner Fehr, Steinheim, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,579

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047426

Int. Cl.³ B60H *3/00*; F04B *49/06*

U.S. Cl. 62—133 **10 Claims**



1. A process for controlling the volume of air moving through a duct system and admitted into the passenger compartment of a vehicle, comprising the steps of:

(a) moving the air through an inlet of the duct system under dynamic pressure;

(b) conducting the air through the duct system by means of a propulsion system comprising a radial blower with forwardly curved blades driven by a direct current electric motor, wherein the electric current drawn by said motor varies with changes in the dynamic pressure of the air in the duct system; and

(c) adjusting the amount of air admitted into the duct system by varying the cross-sectional area of said duct system in response to the current drawn by said motor and thus, also responsive to the dynamic pressure of said air, said adjusting step thereby maintaining a constant volume of air moving through the air duct system.

4,462,218

AIR-CONDITIONING SYSTEM FOR MOTOR VEHICLE COMPARTMENT AND METHOD FOR CONTROLLING THE SAME

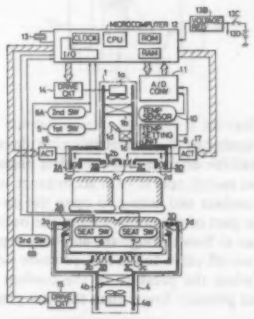
Takayuki Yamanaka, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 24, 1983, Ser. No. 478,549

Claims priority, application Japan, Mar. 25, 1982, 57-48409

Int. Cl.³ F25B *7/00*

U.S. Cl. 62—175 **19 Claims**



1. An air-conditioning system for a motor vehicle compartment having first and second zones, comprising:

(a) a first air-conditioning unit arranged to deliver temperature-controlled airflow into said compartment, said first air-conditioning unit having at least one air outlet facing said first zone;

(b) means for changing the direction of said airflow in accordance with an electrical signal;

(c) a second air-conditioning unit arranged to deliver temperature-controlled airflow into said compartment in response to a detection signal from a manually operable switch, said second air-conditioning unit having at least one air outlet facing said second zone;

(d) means for detecting the presence of one or more occupant in the second zone; and

(e) a control unit for producing said control signal with which the direction changing means is controlled so that said airflow from said air outlet of said first air-conditioning unit are directed not only to said first zone but also to said second zone when said second air-conditioning unit is in off-state and when one or more occupant in said second zone has been detected.

4,462,219

REFRIGERATION SYSTEM

Takayuki Iwata, Fujinomiya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 10, 1982, Ser. No. 376,499

Claims priority, application Japan, May 13, 1981, 56-68996[U]

Int. Cl.³ F25B *41/04, 41/06*

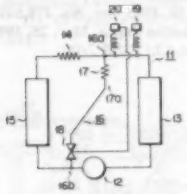
U.S. Cl. 62—196.1 **5 Claims**

1. A refrigeration system comprising:

a main circuit including a compressor, a condenser connected to the high pressure side of the compressor a main expansion mechanism connected to the outlet side of the condenser, and an evaporator connected to the outlet side of the main expansion mechanism, the outlet side of said evaporator being connected to the low pressure side of the compressor whereby a coolant is circulated through the main circuit to effect a refrigerating cycle;

a bypass circuit including an auxiliary expansion mechanism the inlet side of which is connected to the high pressure side of the compressor, and an on-off valve the inlet side of which is connected to the outlet side of the auxiliary expansion mechanism and the outlet side of which is connected to the low pressure side of the compressor;

a circuit breaker switch operative in accordance with the pressure of the coolant flowing through said main circuit



and acting to disconnect the main circuit when the pressure of the coolant reaches a first preset pressure; and

a bypass switch operative in accordance with the pressure of the coolant and acting to open the on-off valve so as to cause part of the coolant from the outlet side of the condenser to flow through the auxiliary expansion mechanism and on-off valve to the low pressure side of the compressor when the pressure of the coolant reaches a second preset pressure lower than the first preset pressure.

4,462,220

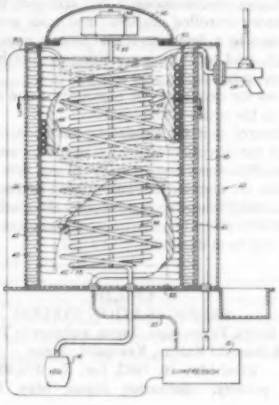
COOLING SENSOR FOR REFRIGERATION SYSTEM

Frank M. Iannelli, Spartanburg, S.C., assignor to Gerlach Industries, Spartanburg, S.C.

Continuation-in-part of Ser. No. 316,873, Oct. 30, 1981. This application Apr. 18, 1983, Ser. No. 486,253

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—201 **3 Claims**



1. A refrigeration system for cooling a beverage as said beverage is drawn from a container comprising:

a container having a vertically extending wall and a top and a bottom,

water carried in said container,

an evaporator coil carried adjacent the wall of said container extending vertically from adjacent the bottom of said container to adjacent the top of said container;

refrigeration condensing means circulating a refrigerant through said evaporator coil cooling said water carried in said container and bulding an ice bank along the inner wall of said container;

a vertically extending beverage dispensing coil centrally carried within said container;

said beverage dispensing coil having a predetermined outside diameter so as to provide a space between said inside wall of said container and said beverage dispensing coil for allowing said bank of ice to build up on said inside wall without touching said beverage dispensing coil;

a helical support coil extending from adjacent the top of said container to adjacent the bottom, said helical support coil encircling said beverage dispensing coil and extending into said space provided between said beverage dispensing coil and said ice bank, and

a temperature sensor carried within said helical coil for activating said refrigeration condensing means responsive to said ice bank building up closely adjacent any portion of said helical support tube.

4,462,221

APPARATUS FOR COOLING BULK PRODUCTS

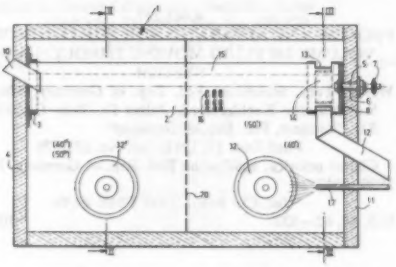
Alain Roullet, Villejuif, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Aug. 31, 1982, Ser. No. 413,451

Claims priority, application France, Sep. 10, 1981, 81 17156

Int. Cl.³ F25D *25/02*

U.S. Cl. 62—381 **7 Claims**



1. Apparatus for cooling bulk products, comprising a perforated drum that rotates about a substantially horizontal axis, means to introduce material to be cooled into one end of the drum, means to withdraw cooled material from the other end of the drum, means to rotate the drum, a thermally insulated enclosure within which the drum is disposed, partition means within the enclosure sealing against horizontally spaced portions of the periphery of the drum, means to introduce a cooling gas into the enclosure, and means to force said cooling gas upward through the drum between said sealing means while the drum rotates, thereby to expose material in the drum to said upwardly moving cooling gas.

4,462,222

DILUTE SOLUTION PRODUCING SYSTEM OF ABSORPTION REFRIGERATING APPARATUS

Shigeo Sugimoto; Ryohei Minowa, and Kozi Sakai, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,593

Claims priority, application Japan, Dec. 11, 1981, 56-198404

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—476 **11 Claims**

1. In an absorption refrigerating apparatus comprising:

at least one generator having a heating source for heating a solution to generate a refrigerant in a gaseous state;

a condenser for condensing said refrigerant in the gaseous state by cooling into a refrigerant in a liquid state;

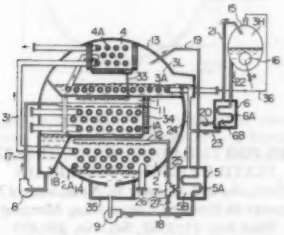
an evaporator causing the refrigerant in the liquid state to evaporate for performing cooling by utilizing the latent heat of evaporation;

an absorber having a refrigerant in a gaseous state produced in said evaporator and a concentrated solution produced in said generator introduced therein to cause the refrigerant in the gaseous state to be absorbed into the concentrated solution to produce a dilute solution;

a solution pump for feeding said dilute solution into said generator; and

a heat exchanger for causing a heat exchange to take place between the solution flowing into said generator and the solution flowing out of the generator;

wherein said absorber has a nest of cooling water tubes comprising a plurality of heat transfer tubes extending from one end of a shell to the other end thereof to allow cooling water to flow into said heat transfer tube through one end thereof and flow out of it through the other end thereof;



a dilute solution producing system comprising:

spray header means located above said nest of heat transfer tubes in said absorber and divided into a plurality of spray header sections extending in a longitudinal direction of the heat tranfer tubes, a first spray header section located nearest an outlet end of the cooling water being connected to a path of flow of the solution flowing out of said generator so as to spray the solution flowing out of the generator, the solution sprayed by said first spray header section absorbing a refrigerant in a gaseous state so as to produce a solution of intermediate concentration; and

at least one solution spray pump for drawing by suction said solution intermediate concentration and feeding same into the next following spray header section, a solution sprayed by the spray header section located nearest an inlet end of the cooling water in the absorber absorbing a refrigerant in a gaseous state to produce a dilute solution.

4,462,223

METHOD AND MEANS FOR PREVENTING COUPLING FREEZING

Warren E. Perkins, Port St. Lucie, Fla., assignor to CRYO$_2$ Corporation, Fort Pierce, Fla.

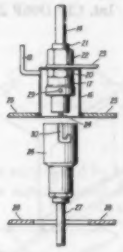
Filed Mar. 28, 1983, Ser. No. 479,495
Int. Cl.^{3} F25B *39/02*
U.S. Cl. 62—514 R **28 Claims**

1. Means for preventing freezing of atmospheric moisture on a coupling during the transfer of a cryogenic liquid from a storage container to an other container comprising:

tubulation means extending from a liquid-filled portion of said storage container to a point external to said storage container and terminating in a first coupling means;

tubulation means extending from the interior of said other container to a point external to said other container and terminating in a second coupling means, said first and second coupling means adapted to matingly connect and allow passage of liquid there through;

shield means encircling said second coupling means, said shield means conforming in shape to said first coupling means and having a opening sized to allow entry of said first coupling means for mating connection to said second coupling means and to allow venting of gas from the interior of said shield means to the atmosphere; and



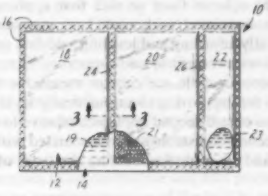
conduit means communicating between a normally vapor-filled portion of said other container and the interior of said shield means at a point remote from said opening.

4,462,224

INSTANT HOT OR COLD, REUSABLE COLD PACK

Wayne K. Dunshee, Maplewood, and Robert W. H. Chang, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 11, 1983, Ser. No. 512,642
Int. Cl.^{3} F25D *3/08*
U.S. Cl. 62—530 **20 Claims**



1. An instant hot or cold pack for transferring heat to or from an object adapted to be reuseable as a cold pack comprising:

a. a first compartment containing a predetermined amount of a solvent comprised primarily of water;

b. a second compartment containing a predetermined amount of a particulate solute capable of essentially completely dissolving in the solvent whereby a predetermined amount of heat is liberated or absorbed;

c. means for mixing the contents of the first compartment and the second compartment at the time of use whereby the solute can be dissolved in the solvent;

d. a third compartment containing a predetermined amount of a gelling agent capable of gelling with the solvent and solute solution at ambient temperature and producing a gel that is relatively soft and moldable when cooled to temperatures at least as low as −18° C.; and

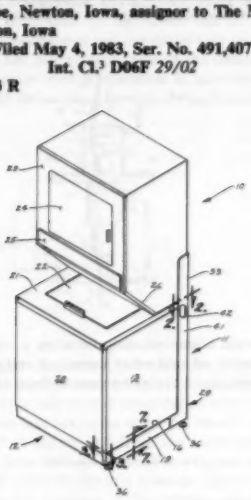
e. means for mixing the contents of the third compartment with the previously-mixed contents of the first compartment and the second compartment whereby the gelling agent can be gelled with the solvent and the solute solution.

4,462,225

APPLIANCE LEVELING AND LOCATING STRUCTURE

William J. Noe, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed May 4, 1983, Ser. No. 491,407
Int. Cl.³ D06F 29/02
U.S. Cl. 68—3 R 6 Claims



1. Appliance leveling and locating structure, the combination comprising: first and second appliances each having cabinet means for supporting and generally enclosing the respective appliances; means including a pair of generally L-shaped members for supporting said first appliance in an elevated position above a support surface a space sufficient to receive said second appliance therebetween, each of said L-shaped members comprising a generally horizontally extending base member engageable with said support surface and a generally upright column fixed to said first appliance; first adjustable means associated with each base member and operable for vertically adjusting and leveling said first appliance supporting means with respect to said support surface; means mounted on said second appliance cabinet means for engaging with said means for supporting to automatically level and locate the rear portion of said second appliance relative to said first appliance; and second adjustable means associated with said second appliance and operable for leveling the front of said second appliance.

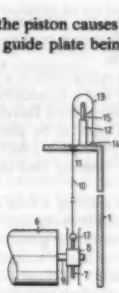
4,462,226

APPARATUS FOR SUPPORTING A ROLL LOOPED AROUND BY A TEXTILE MATERIAL

Heinz Fleissner, Egelsbach, Fed. Rep. of Germany, assignor to Vepa AG, Riehen, Switzerland

Filed Sep. 15, 1981, Ser. No. 302,616
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035383
Int. Cl.³ D06B 3/12, 23/04
U.S. Cl. 68—5 D 5 Claims

1. An apparatus for supporting a guide roll horizontally which roll is looped around partially from the bottom by a length of textile material and is arranged in a housing of a festoon steamer, said apparatus comprising means for suspending the guide roll at each of its ends, the suspension means including a cable that is extended through the ceiling of the housing and that is supported at that location to be vertically controllable, a pressure-actuated piston cylinder unit, a rotatable guide pulley supported on the piston, and a guide plate arranged at each end of the guide roll; said cable being attached to said guide plate, being looped around the top of the pulley and then being fastened to the housing whereby vertical upward movement of the piston causes the cable to lift an end of the guide roll; said guide plate being guided vertically by



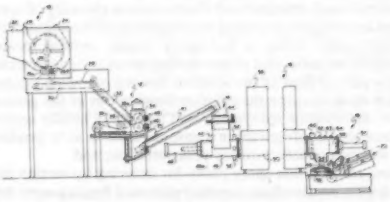
means for providing a vertically extending track located within said housing.

4,462,227

APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE FIBROUS MATERIALS

Julian B. Wilson, Jr., and Anthony W. Nusz, both of Morganton, N.C., assignors to Beu-Tex Corporation, Morganton, N.C.

Filed Jun. 21, 1982, Ser. No. 390,203
Int. Cl.³ D06B 21/00, 23/00
U.S. Cl. 68—5 D 4 Claims



1. In apparatus for continously treating moving textile materials in fiber form, including means for impregnating the fibers with a dye or other chemical, means for compressing and conveying the impregnated fibers in continous compacted mass form through an elongate heating tube to fix or react the dye or chemical on the fibers, means for periodically discharging compacted mass sections of the fibers from the heating tube, and means for conveying the discharged fiber sections in a path of travel to wash the fibers prior to collection; the improvement therewith comprising means positioned in the path of movement of said compacted fiber mass sections from the heating tube for breaking apart the sections and generally uniformly distributing the fibers on said conveying means to facilitate washing of the fibers prior to collection, said breaking and distributing means comprising first agitating means positioned adjacent a first surface portion of said conveying means for engaging the compacted fiber mass sections and directing fibrous portions of the same in an arcuate path of movement onto a second surface portion of said conveying means, second agitating means positioned adjacent said second surface portion of said conveying means for engaging the fibrous portions of the fiber sections on the conveying means and for redirecting at least portions of the same in an arcuate path back onto said first surface portion of said conveying means for reengagement by said first agitating means.

4,462,228

APPARATUS FOR MERCERIZING TEXTILES AND FABRICS

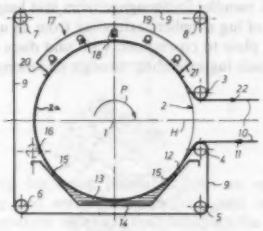
Werner Packschies, Krefeld, and Günther Miethe, Meerbusch, both of Fed. Rep. of Germany, assignors to Kleinewefers, Jaeggli AG, Rumikon/Elsau, Switzerland

Filed Nov. 12, 1981, Ser. No. 320,487

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043167

Int. Cl.³ D06B 7/08

U.S. Cl. 68—22 R 4 Claims



1. A single apparatus for mercerizing and caustic-soda-lye removal from fabrics of cotton or cotton blends with two different liquid media, said apparatus in combination comprising:

a single drum having a closed-surface mantle as well as having a lower portion and upper profile quadrants, textile material being movable about and looped around said drum;

a liquid-permeable pressure band looped around said drum, said pressure band moving synchronously with said textile material and pressing the latter against said drum mantle;

an immersion trough containing as one of said two liquid media mercerizing lye for impregnating said textile material and connected with a supply for mercerizing lye, with at least a part of only the lower portion of said drum, with said textile material looped therearound, being immersed in said trough, said textile material being guided between said drum mantle and said pressure band before and after, as well as during, said impregnation; and

a device arranged above at least one of the upper profile quadrants of said drum for removing lye from said textile material absorbed in said trough with the other of said two liquid media, removal of lye being effected through said textile material while the latter and the pressure band are still looped around said single drum and while maintenance of width of said textile material occurs therewith to assure against shrinkage of the textile material.

4,462,229

CLOSEABLE THREADLINE GUIDE FOR SUPPRESSING FLUID FLOW

André Lafeber, Harrogate, England, and Frank R. Wilson, Abergavenny, Wales, assignors to Imperial Chemical Industries PLC, London, England

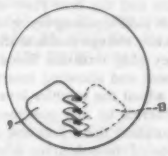
Filed Oct. 29, 1982, Ser. No. 437,760

Claims priority, application United Kingdom, Nov. 19, 1981, 8134918

Int. Cl.³ D06B 23/00, 23/18

U.S. Cl. 68—212 6 Claims

1. A fluid flow suppressor for use with a running threadline comprising a pair of members, at least one of which is movable with respect to the other, provided with apertures through which the threadline may be threaded when the apertures are superimposed, the improvement being that each of the members are provided with a slot, the slot in one of the members opening into the right hand side of the aperture in that member and the slot on the other of the members opening into the left hand side of the aperture in that other member, the slots being so disposed that on mutual movement of the members they superimpose across each other, in which position fluid flow



axially of the threadline is suppressed by being confined to the cross sectional area of the superimposed slots not occupied by the running threadline.

4,462,230

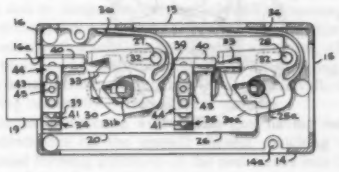
CHANGEABLE SAFE DEPOSIT LOCK WITH SLIDABLE CLAMPED FENCES

Walter R. Evans, Lancaster, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Aug. 18, 1982, Ser. No. 409,611

Int. Cl.³ E05B 25/00

U.S. Cl. 70—383 16 Claims



1. A changeable combination key lock comprising a lock case defining a generally box-like enclosure having front and rear vertical walls, a bolt plate slidably movable adjacent one of said walls between projected locking and retracted unlocking positions having a stack of fence members carried thereon each having a generally rectangular vertically elongated body portion and a horizontally extending foot portion projecting therefrom, a stack of peripherally gated pivoted tumbler levers occupying positions in the locked condition of the lock to bar retraction of said fence members and said bolt plate from the projected locking position and movable responsive to a key to adjust the gating recesses to accommodate said foot portions of said fence members to permit retraction of the bolt to unlocking position, a rotatable key receiving member for insertion of a key therein into engagement with said tumbler levers for adjusting them to align their gating recesses with the feet of the fence members for unlocking retraction of the bolt, the bolt plate having a shaped opening therein, a driving cam associated with said key receiving member to be rotated by the key and having a projection located in said shaped recess for moving the bolt plate between said locking and unlocking positions, means extending from said bolt plate supporting the fence members of the stack for vertically guided adjustment to positions corresponding to a predetermined range of key shapes, a fence clamping assembly comprising a clamping member including a flange portion to overlap the face of stack of fence members opposite said bolt plate and a clamping screw coupled to said clamping member and said bolt plate to clamp the fence members in fixed positions against said bolt plate when the screw is in tightened fence clamping position, one of said vertical walls having means receiving a head portion of said clamping screw accommodating movement of the bolt plate and head through a predetermined first range from the locking to unlocking position and having a stop shelf formation located to abut the clamping screw head at the unlock-

ing position of the bolt plate, said stop shelf and clamping screw head being shaped to accommodate a short extent of additional retracting movement of the bolt plate to a key change position when said clamping screw is rotated to a fence releasing position and the bolt plate occupies the unlocking position, said bolt plate opening being shaped to accommodate key rotation to a key change position allowing retraction of the key from the key plug with the fence members released for vertical adjustment and allowing insertion of a new key into the key plug to adjust the tumbler levers and the fence members interfitted therein to new positions corresponding to the new key configuration upon rotation of the new key to the unlocking position of the bolt plate, whereupon rotation of the clamping screw to return to clamping position fixes the fence members in the new key position.

4,462,231

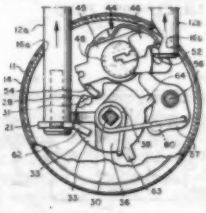
PADLOCK

Herbert E. Zabel, Wheaton, Ill., assignor to American Home Products Corporation, New York, N.Y.

Filed Sep. 2, 1982, Ser. No. 414,010

Int. Cl.³ E05B *37/10*

U.S. Cl. 70—21 **5 Claims**



1. A padlock comprising a body member having openings therein, a shackle having legs slidable in said openings, one of said legs having a notch therein, a rotatable locking mechanism having a slidable bolt extending therefrom into said notch, a rotatable key mechanism disposed concentrically within said locking mechanism and operable in one position to maintain said bolt extending into said notch, and operable in another position to retract said bolt from said notch, and a combination mechanism operable to rotate the locking mechanism to move the bolt out of the notch when the key mechanism is in one position to maintain said bolt extending into the notch.

4,462,232

COMBINATION LOCK FOR LUGGAGE CASES

Gwo T. Yang, No. 11, Alley 23, Kuan San La., Kung Kuan Rd., Pei Tau, Taipei, Taiwan

Filed Apr. 20, 1982, Ser. No. 370,230

Int. Cl.³ E05B *37/02*

U.S. Cl. 70—312 **3 Claims**

1. A combination lock for a luggage case, comprising:

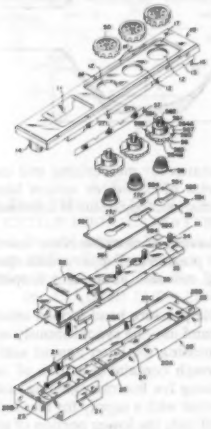
a frame having an opening and a planar surface at one side of said opening, said frame being adapted to be mounted on one part of the luggage case;

a plurality of dial wheels rotatably mounted flat on said planar surface of said frame and arranged side by side in line with said opening, each dial wheel having a center hole and a plurality of code figures on an upper surface of said dial wheel and around said center hole and a bore in a bottom side of said dial wheel, said bore being coaxially formed with said center hole and provided with a plurality of recesses in the periphery of said bore;

a plurality of lock wheels corresponding with dial wheels, each lock wheel having a center rod extending axially through said center hole of respective dial wheel and a key member on said center rod, said key member being capable of selectively engaging and disengaging said recesses of said bore of respective dial wheel, a disc member provided with a radial slot, and a lower stem; each lock wheel being supported by a resilient member;

a retaining plate for retaining said lock wheels and said resilient members with respect to said frame, said retaining plate having a plurality of through holes to allow said lower stems of said lock wheels to extend therethrough, each through hole being provided with an elongated slot;

a lock plate having a hook member and being capable of moving in one direction to cause said hook member to engage a hasp member provided on another part of the luggage case and moving in an opposite direction to cause said hook member to disengage from said hasp member; a plurality of lug members extending from an upper side of said lock plate to correspond with said discs of said lock wheels, each lug extending through said elongated slot of



said retaining plate and being capable of engaging respective radial slot of said disc member of said lock wheel when said lock wheels are rotated to align said radial slots with said lugs, said lugs being disposed adjacent to respective disc so as to prevent the movement of said lock plate when the lock plate is moved to cause said hook member to engage with said hasp member and said lock wheels are rotated to move said radial slots out of alignment with said lugs; said lock plate further having a knob extending through said opening of said frame, and a plurality of holes to correspond with said lower stems of said lock wheels when said lock plate is moved to a position where said hook member is caused to disengage from said hasp member; and

a base for slidably holding said lock plate with respect to said frame.

4,462,233

DETACHABLE GUARD FOR KEYHOLES

John R. Horetzke, 152 Baldwin Rd., Billerica, Mass. 01821

Filed Apr. 26, 1982, Ser. No. 371,523

Int. Cl.³ E05B *17/14*

U.S. Cl. 70—428 **10 Claims**

1. A detachable guard for preventing access to the keyhole of cylinder type locks in a wall of a locked drawer or the like:

said wall having a front face and a rear face;

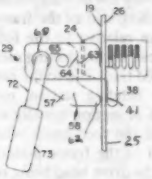
the front face of the said wall having a pair of spaced apart openings of pre-determined size, each on an opposite side of the cylinder lock;

said guard comprising a generally U-shaped body having a pair of anchor legs which are joined at one end on a rivet;

said legs being adapted to straddle the keyhole of said cylinder type lock;

each of said anchor legs having a free terminal end with an integral tongue extending at right angles thereto and each adapted to be received in one of said openings to contact the rear face of said wall;

a locking leg journalled on said rivet between said pair of anchor legs, and having a free terminal tip;



said locking leg being pivotable from an open position, releasing said anchor tongues from said openings to a closed position with said tip contacting the front face of said wall and locking said tongues in said openings;

said pair of anchor legs and said locking leg each having holes, which register with each other, when said legs are in locking position to receive the shackle of a padlock.

4,462,234

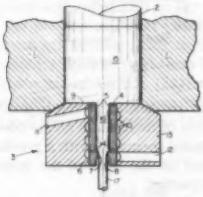
RAPID EXTRUSION OF HOT-SHORT-SENSITIVE ALLOYS

Robert J. Fiorentino, Worthington, and E. Garland Smith, Jr., Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 161,019, Jun. 19, 1980, abandoned. This application Jun. 1, 1981, Ser. No. 265,891

Int. Cl.³ B21C *23/08, 23/32, 25/02, 29/04*

U.S. Cl. 72—41 **11 Claims**



1. A method for extruding products from a metal billet at higher than conventional rates and/or at lower extrusion pressures than for single dies while maintaining a good surface finish, comprising

(a) extruding a primary extrusion product from the billet through a primary reduction die having an extended land,

(b) cooling at least an outer surface region of the primary extrusion product over substantially the entire extended land to reduce or maintain the temperature thereof below the solidus temperature at atmospheric pressure of the lowest melting phase prior to a second reduction, and

(c) extruding the cooled primary extrusion product through a secondary reduction die and maintaining the temperature of at least a substantial portion of the primary extrusion product above the recrystallization temperature, and producing a back pressure on the metal alloy in the primary reduction die sufficient to keep the primary extrusion product in contact with the extended primary die land and to reduce tensile stresses therein.

4,462,235

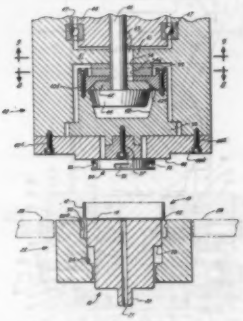
METHOD FOR THREADING CLOSURES

Roderick V. King, Girard, Pa., assignor to Specialty Packaging Products, Inc., Richmond, Va.

Division of Ser. No. 221,568, Dec. 31, 1980, Pat. No. 4,420,959. This application May 23, 1982, Ser. No. 497,126

Int. Cl.³ B21H *3/04*

U.S. Cl. 72—103 **9 Claims**



1. A method of forming lug threads in closure having a top surface and an integral cylindrical sidewall comprising:

a. vertically lowering the closure until its shoulder makes contact with a shoulder provided on a cap nest which has a plurality of individual inwardly directed lug thread forming members extending from its sidewall, the nest being carried by a fixed support member;

b. vertically lowering a threading tool having individual indentations on the outside thereof matching the lug thread forming members on the nest means into the interior of the closure;

c. transversely moving the threading tool so that the lug thread forming members on the cap nest make contact with the cylindrical wall of the cap; and

d. moving the threading tool around the cylindrical wall of the closure in an orbital path while restraining the threading tool against both rotational and longitudinal movement to form a plurality of lug threads in the cylindrical wall of the closure.

4,462,236

FOURTEEN-HIGH ROLLING MILL

John W. Turley, Oxford, and Michael G. Sendzimir, Woodbury, both of Conn., assignors to T. Sendzimir, Inc., Waterbury, Conn.

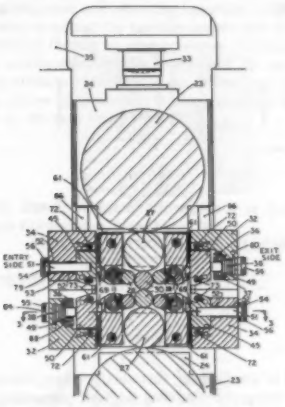
Filed Mar. 26, 1982, Ser. No. 362,459

Int. Cl.³ B21B *29/00, 31/16*

U.S. Cl. 72—242 **7 Claims**

1. A fourteen-high rolling mill roll arrangement consisting of an upper and a lower seven-roll cluster, each of said clusters comprising a work roll, an intermediate roll and a back-up roll arranged in the same vertical plane, two side intermediate rolls, one contacting each side of said work roll, and two side back-up rolls, each contacting one of said side intermediate rolls, said intermediate roll and said back-up roll for each cluster being mounted in chocks, said work roll floating freely in said cluster, said side intermediate rolls being mounted in chocks, and said side back-up rolls each comprising several rollers rotatably mounted upon a stationary shaft, each of said side back-up roll shafts being mounted in and supported at intervals through its length by an adjustable stationary rigid support beam assembly, each of said adjustable rigid support beam assemblies comprising a support arm affixed by pivot means at its ends to the chocks of the adjacent one of said intermediate rolls, said support arm mounting the chocks of its respective side intermediate roll and the shaft of its respective side back-

up rollers, a spacer in association with each of said support arms to adjust the horizontal position thereof to control clearances between said work rolls, said side intermediate rolls and said back-up rolls, and a stationary side support beam in association with each of said support arms to give rigid support to its respective support arm and spacer thereof, said mill having a



pair of mill housings, each of said stationary side support beams extending between and being mounted on said mill housings, and means to adjust each support arm vertically to adjust the position of the axes of each side intermediate roll and its adjacent side back-up roll until said axes and the axis of the adjacent work roll all lie substantially in one plane, whereby to minimize bending forces on said side intermediate rolls.

4,462,237

METHOD OF BENDING FRAME MATERIAL FOR THE PRODUCTION OF COMPOUND PLATES, PARTICULARLY COMPOUND GLASS PANES

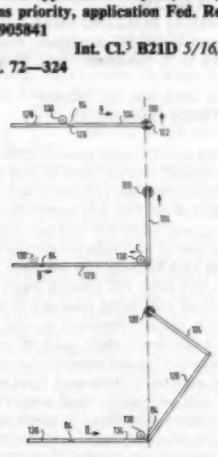
Josef Käuferle, deceased, late of Aichach, Fed. Rep. of Germany (by Viktoria Käuferle, heiress), and Werner Lutzke, Friedberg, Fed. Rep. of Germany, assignors to Josef Käuferle KG, Aichach, Fed. Rep. of Germany

Division of Ser. No. 120,919, Feb. 12, 1980, Pat. No. 4,356,614. This application May 25, 1982, Ser. No. 381,789

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1979, 2905841

Int. Cl.³ B21D *5/16, 53/74*

U.S. Cl. 72—324 **5 Claims**



1. Method of bending a frame from a frame material comprising the steps of feeding an elongated section of the frame material having a leading end to a bending station and moving the frame material into the bending station along a straight horizontal feed track, providing weakened areas at spaced positions along the length of the frame material with the spacing between the weakened areas corresponding to the lengths of the sides of the frame to be formed, feeding the leading end of the frame material into a drive head so that the leading end is received in the drive head and providing a driving member for the drive head, moving the driving member and with it the drive head and the leading end of the frame material along a vertical path of motion relative to the feed track, rotatably supporting the drive head on the driving member about an axis perpendicular to the feed track and to the path of motion of the frame material in the bending station, moving the driving member along the path of motion initially away from the feed track and then toward the feed track while the drive head moves the leading end of the frame material along with the driving member, with the drive head being rotatable relative to the driving member and at the same time moving the following frame material along the feed track in the feed direction and bending the frame material at the weakened areas while holding the frame material on the feed track so that the adjacent section of the frame material moving upwardly from the feed track and separated by a weakened area moves angularly toward the frame material remaining on the feed track for forming the frame.

4,462,238

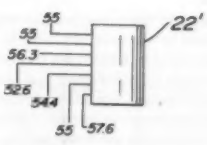
METHOD FOR CONTROLLING PROPERTIES OF METALS AND ALLOYS

Glenn B. Goodfellow, Wyckoff, N.Y., assignor to UTI Corporation, Collegeville, Pa.

Filed Dec. 20, 1982, Ser. No. 451,136

Int. Cl.³ B21D *22/00*

U.S. Cl. 72—358 **13 Claims**



1. A method for increasing strength and/or controlling mechanical properties of metals and alloys comprising

(a) producing a metal specimen with a preshape and dimensions determined on the basis of the desired strength or mechanical properties,

(b) introducing said preshaped specimen into a confined chamber which defines and desired peripheral final shape, spacing at least a portion of the periphery of said preshaped specimen from at least a portion of the walls defining said chamber with the relative dimensions of the spacing being governed by the amount of cold work needed to achieve desired strength or mechanical properties in that portion of the specimen,

(c) engaging one face of said specimen with at least one moveable wall of said chamber and applying a continuous compressive force by said wall with a sufficient magnitude to force the preshaped specimen to deform and fill the chamber at the end of the compressive stroke while simultaneously decreasing length and maintaining the volume of the specimen constant, and

(d) applying said compressive force by moving said moveable wall of the chamber sufficiently slowly so that the yield strength of the specimen progressively increases, and progressively increasing the magnitude of said force as the yield strength increases until the entire circumfer-

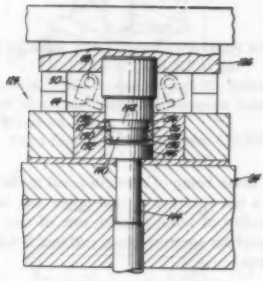
ence of the specimen contacts the walls of the chamber and attains said desired final shape at the end of the compressive stroke of said movable wall.

4,462,239

METHOD FOR MANUFACTURING A BEARING SUPPORT COLLAR

William L. Pringle, 999 Lake Shore Rd., Grosse Pointe Shores, Mich. 48236

Filed Sep. 30, 1982, Ser. No. 431,224
Int. Cl.³ B21D *22/02*
U.S. Cl. 72—359 2 Claims



1. A method of making a collar (10') having an annular and flat outer surface (118) and an inner surface having an inwardly tapering first portion (120) and a peripheral outwardly tapering notch portion (122), said method comprising the steps of: providing a die assembly (124) including a die cavity (128) having an annular seating surface (130) with an opening (132) therethrough and an annular side wall (134) and a reciprocating forming die (136) including a shoulder portion (138) closely fitting against the side wall (134) of the cavity (128) and a cylindrical portion (140) and a frustoconical portion (142) therebetween, and positioning the forming die (136) to enter the die cavity (128) so that the cylindrical portion (140) enters the opening (132) of the seating surface (130); disposing a preformed cylindrical collar (10) in the die cavity (128); and compressing the preformed collar (10) between the shoulder (138) and the seating surface (130) as the forming die (136) enters the die cavity (128) to cold form the first portion (120) against the frustoconical surface (142) and to cold form the notch portion (122) within the space between the cylindrical portion (140) and the seating surface (130). to form the collar (10').

4,462,240

HANDGUN, BLIND RIVET INSTALLATION

Albert K. Yamamoto, Huntington Beach, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Filed Jun. 25, 1982, Ser. No. 392,196
Int. Cl.³ B21D *9/05*
U.S. Cl. 72—391 10 Claims

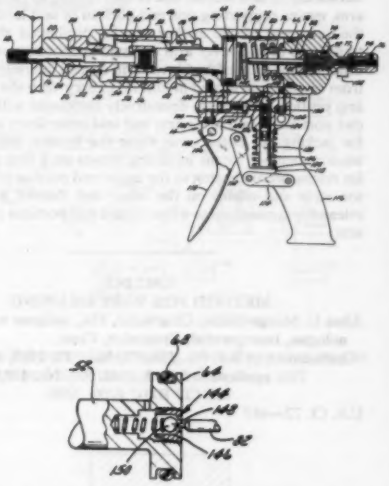
1. A hydraulic insert fastener gun comprising

(a) A mandrel adapted to receive an insert for installation in a panel;

(b) hydraulic means for moving said mandrel from a first position to a second position, said hydraulic means including an adjustable stroke limiting means for rendering said hydraulic means inoperable after said mandrel has moved a predetermined distance from the first position;

(c) means for actuating said hydraulic means;

(d) said hydraulic means further includes a cylinder and a piston with a spring-biased ball valve means positioned with in the head of said piston and providing fluid communication between the volumes of the cylinder separated by said piston head, said valve means normally being closed; and



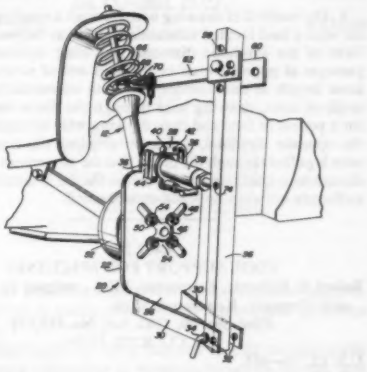
(e) said adjustable stroke limiting means including a stationary shaft mounted substantially axially in said cylinder and having an end which contacts and opens said ball valve after said piston has moved a predetermined distance.

4,462,241

WHEEL ALIGNMENT DEVICE

Charles T. Whisenant, 2121 4th St., Brunswick, Ga. 31520

Filed Jul. 16, 1982, Ser. No. 398,835
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—458 10 Claims



1. A wheel alignment device for use in correcting the caster and the camber of vehicle wheels supported from McPherson strut-type suspension units and designed for controlled bending of the lower end of an associated unit, said device including a mount having a central portion defining first and second sides and provided with a plurality of openings therethrough for support of said mount from a vehicle hub wheel mounting portion in lieu of the wheel normally mounted on said hub and with said first side opposing said hub, said mount also including remote lever arm portions extending outwardly from said central portion in opposite directions generally normal to a ray normal to said first side, an anchor arm carried by the outer

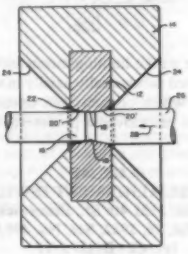
end portion of one of said lever arm portions and projecting outwardly of said second side of said mount, an elongated lever arm, means supporting one end portion of said lever arm from the outer end of said anchor arm for oscillation about an axis transverse to said lever arm and said anchor arm and with the other end portion of said lever arm spaced laterally outwardly from second side of said mount in registry with the other lever arm portion, jack means operatively associated with said other end portion of said lever arm and said other lever arm portion for jacking the latter away from the former, and elongated tension member means including means on a first end thereof for releasable anchoring to the upper end portion of a McPherson strut and means on the other end thereof for selective releasable connection to a first of said end portions of said lever arm.

4,462,242

METHOD FOR WIRE DRAWING

Allen C. Morgenthaler, Clearwater, Fla., assignor to GK Technologies, Incorporated, Greenwich, Conn.

Continuation of Ser. No. 128,377, Mar. 10, 1980, abandoned.
This application Sep. 2, 1982, Ser. No. 413,978
Int. Cl.³ B21C *9/00, 3/00*
U.S. Cl. 72—467 **4 Claims**



1. The method of drawing wire through a synthetic diamond die with a land located substantially midway between opposite faces of the synthetic diamond providing tapered approach passages at opposite ends of the land and of substantially the same length as one another and with substantially the same angle of taper, drawing wire through the die in one direction for a period of time and then drawing wire through the die in the opposite direction, and approximating the time in which wire is pulled through the die so that the movement in opposite directions is alternated and wear on the die is distributed more uniformly between opposite ends thereof.

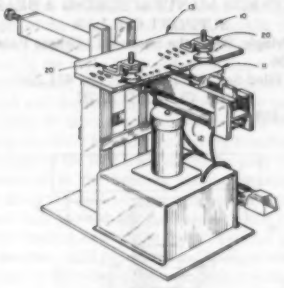
4,462,243

TOOL SUPPORT FOR MACHINES

Robert E. Richards, Kalamazoo, Mich., assignor to J. A. Richards Company, Kalamazoo, Mich.

Filed Sep. 20, 1982, Ser. No. 419,978
Int. Cl.³ B21D *37/04*
U.S. Cl. 72—481 **6 Claims**

1. Means for adjustably supporting tools on a machine tool having a tool supporting platform, said platform having a flat work surface and means for applying a working force in one direction parallel to said surface, said supporting means including: said platform having a plurality of openings therein, said openings being elongated in the plane of the platform and having interconnected narrow and wide portions at opposite ends, said openings being arranged in pairs with the openings of each pair spaced apart and aligned along their greater axes; a tool holder bracket having oppositely extending upper and lower legs and a generally vertical web interconnecting said legs; said legs being parallel to each other and the surface of said platform; a pair of anchor members depending from the lower face of of each said lower legs, said members each having a shank portion and an enlarged head at the free end of the shank, said head being of a size to pass through the larger portion of one of the openings but not the smaller portion, said shank being of a size to seat in the narrower portion of the same



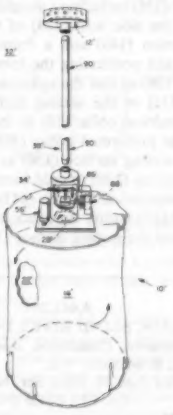
opening; said shank being of a length equal to the axial length of openings; a pin aperture in said upper leg; said platform having a plurality of holes therein, one of said holes being aligned with said pin aperture when said tool holder is secured to said platform.

4,462,244

APPARATUS FOR FIELD TESTING A SMOKE DETECTOR

Thomas G. Lee, 1122B Aster Ave., Sunnyvale, Calif. 94086

Filed May 3, 1982, Ser. No. 373,910
Int. Cl.³ G08B *29/00*
U.S. Cl. 73—1 G **2 Claims**



1. An apparatus (10') for field testing of an installed smoke detector (12'), comprising:

a collapsible bag structure (14') defining an interior chamber (22'), said collapsible bag structure (14') having an opening (28') communicating said interior chamber (2') to a space (32') exterior of said collapsible bag structure (14');

air impelling means (34') for selectively impelling air via the opening (28') between the space (32') and the interior chamber (22');

movable wand means (38') for directing air from said interior chamber (22') through said opening (28') and into the immediate vicinity of said smoke detector (12');

a pressurized spray can (56') containing a mixture of a propellant and a smoke simulator and being actuable from exterior of said collapsible bag structure (14'), said spray can (56') being adapted to deliver a specific volume of said mixture for each actuation thereof and to deliver a spray of aerosol particles of said smoke simulator to said interior chamber (22') on vaporization of said propellant; and

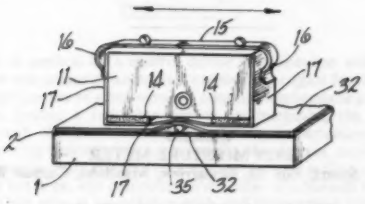
switch means (86) for selectively controlling said air impelling means (34) for impelling air from the space (32') through said opening (28') and into said interior chamber (22') or from said interior chamber (22') through said opening (28'), and through said movable wand means (38') to the immediate vicinity of said smoke detector (12').

4,462,245

APPARATUS FOR TESTING ABRASION RESISTANCE OF PRINTED SURFACES

Richard J. Gould, St. Paul, and George M. Seiter, Golden Valley, both of Minn., assignors to Champion International Corporation, Stamford, Conn.

Filed Nov. 8, 1982, Ser. No. 439,893
Int. Cl.³ G01N 3/56
U.S. Cl. 73—7 **2 Claims**



1. An apparatus for testing abrasion resistance of printed paperboard surfaces which includes relative straight line reciprocative movement between a lower flat plate with a lower deformable surface pad thereon and an upper block having upper deformable members with a space therebetween on the lower surface thereof, which apparatus includes:

means for securing an upper paperboard sample on said upper block so as to overlie said upper deformable members and span the space therebetween,

means for securing a lower paperboard sample strip on said lower deformable surface pad, and

rigid shim means mounted behind and under said lower paperboard sample in a location and position in said space between said upper deformable pads thereby to create a flexing bellows-like motion in said samples in the space between said upper deformable members as they reciprocate opposite and relative to each other and rub against each other.

4,462,246

PERCENT OXYGEN GAUGE

Gulu N. Advani, San Jose; Scott A. Amundson, Mountain View, and Eli M. Goldfarb, Los Altos, all of Calif., assignors to Sierra Monitor Corporation, Sunnyvale, Calif.

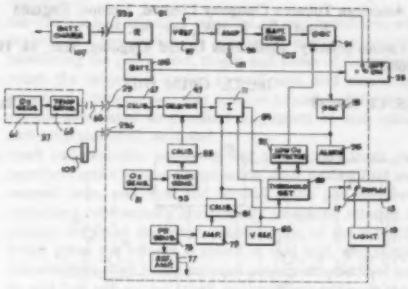
Filed Jun. 4, 1982, Ser. No. 385,188
Int. Cl.³ G01N 27/54
U.S. Cl. 73—23 **10 Claims**

1. An instrument for measuring percent oxygen in air comprising,

an oxygen partial pressure measurement transducer having automatic temperature compensation, and having a first electrical output,

an absolute pressure transducer, having automatic temperature compensation, and having a second electrical output,

a summing junction receiving said first and second electrical outputs and having a transfer function yielding a percent oxygen output signal as a mathematical function of each of said first and second electrical outputs multiplied by a respective constant, and



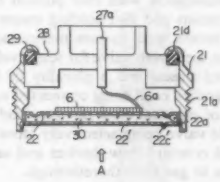
a threshold detector for signalling when the percent oxygen output signal is below a preset value.

4,462,247

KNOCK DETECTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

Tadashi Hattori, Okazaki; Masanori Hanaoka; Yukihide Hashiguchi, both of Toyoda; Yoshinori Ootsuka, Okazaki, and Hiroaki Yamaguchi, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 3, 1982, Ser. No. 354,434
Claims priority, application Japan, Mar. 6, 1981, 56-32859
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 **4 Claims**



1. A knock detecting apparatus for detecting knocking pressure variations in cooling water of an engine, said apparatus comprising:

a first diaphragm for being exposed to said cooling water and being responsive to pressure variations therein, said first diaphragm being non-resonant at knock frequencies to be detected;

a second diaphragm, resonant at said knock frequencies to be detected said first and second diaphragms being arranged to form a sealed double diaphragm structure;

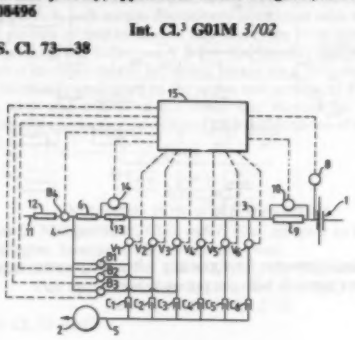
a noncompressible fluid contained in said sealed double diaphragm structure and entirely filling the region between said diaphragms for transmitting vibrations of said first diaphragm; and

means for detecting vibrations of said second diaphragm transmitted thereto via said noncompressible fluid and producing, in response thereto, an electrical signal indicative thereof.

4,462,248
AUTOMATIC PRESSURE/FLOW DEVICE

Arnold W. Cronshaw, Eastleigh, England, assignor to British-American Tobacco Company Limited, London, England

Filed Mar. 8, 1982, Ser. No. 356,172
Claims priority, application United Kingdom, Mar. 18, 1981, 8108496
Int. Cl.³ G01M 3/02
U.S. Cl. 73—38 8 Claims



1. A device for the determination of the gas flow-pressure drop characteristics of a gas permeable material, comprising a gas flow passageway, holding means operable to hold a sample of said material transversely across the cross section of said gas flow passageway; gas flow means operable to maintain a flow of gas through said passageway and through a sample of said material when held in said holding means; pressure indicating means operable to indicate gas pressure differential across the sample, flow rate indicating means operable to indicate the flow rate of gas through the sample; said gas flow means including a plurality of constant flow devices of various predetermined flow rate valves connected in parallel and valve means intermediate said constant flow devices and said holding means, said valve means being operable to obturate gas flow selectively through said constant flow devices; and by-pass means associated with a plurality of said constant flow devices by which a portion of said gas flow means intermediate said constant flow devices and said valve means can be put into gas flow communication with that portion thereof intermediate said valve means and said holding means thereby by-passing said valve means, said by-pass means including atmospheric bleed means, a closable valve for selectively closing said atmospheric bleed means and a plurality of by-pass valves connected in parallel, each being connected to a respective one of a plurality of constant flow devices, said by-pass valves and said closable valve being selectively closable to close selected ones of said constant flow devices and said said atmospheric bleed means to gas flow therethrough.

4,462,249
TANK LEAKAGE DETECTION METHOD

Thomas E. Adams, 10509 - 134 St., Edmonton, Alberta, Canada

Filed Apr. 8, 1981, Ser. No. 252,212
Claims priority, application Canada, Mar. 13, 1981, 372936
Int. Cl.³ G01M 3/24
U.S. Cl. 73—40.5 A 23 Claims

1. A method of detecting a perforation in the wall of a tank containing a stored liquid, comprising:

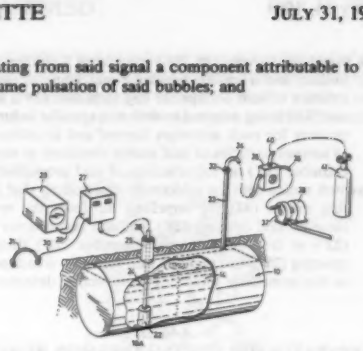
inserting acoustic sensing means into the tank at an insertion point;

hermetically sealing the insertion point to be substantially gas-tight,

reducing the gas pressure in the tank to a level sufficient to produce a pressure difference across the wall of the tank causing fluid to enter the tank, through the perforation;

detecting the acoustic signal produced by bubbles of said fluid entering said tank from said perforation;

separating from said signal a component attributable to the volume pulsation of said bubbles; and

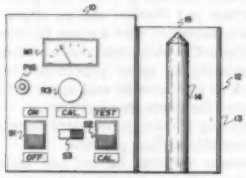


converting said acoustic signal using said separated component to provide a signal indicative of the existence of the perforation.

4,462,250
GRAIN MOISTURE METER

John A. Stuart, Box 11, Grandview, Manitoba, Canada R0L 0Y0

Filed Nov. 16, 1981, Ser. No. 321,436
Int. Cl.³ G01N 27/22
U.S. Cl. 73—73 9 Claims



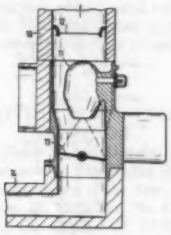
1. A grain moisture indicator comprising a grain cell having two terminals comprising an outer shell and a central element electrically insulated from the shell and arranged such that grain introduced into the cell provides an electrical path between said outer shell and said central element, a half-wave pulse oscillator having an output lead thereof connected to a load, means for connecting said one of the terminals to said load whereby the grain in said cell alters the load applied to the oscillator, signal amplifying means connected to the other terminal whereby the output of said oscillator is amplified and meter means for measuring the amplified output, a thermistor for insertion into the grain being tested and operatively connected across said meter to adjust the readings thereof relative to the temperature of the grain being tested within said cell, and means to calibrate said indicator, said means including a shunt resistor and a dummy load capacitor, and a two-position switch firstly to connect said shunt resistor across said meter, and to disconnect said thermistor from said meter and to connect said dummy load capacitor into parallel circuit with said amplifier means, when in one position, and secondly to disconnect said shunt resistor and re-connect said thermistor, and to disconnect said dummy load capacitor when in the other position.

4,462,251

CONTROL DEVICE IN CONNECTION WITH AN AIR FLOW RATE METER OF AN INTERNAL COMBUSTION ENGINE

Jaihind S. Sumal, Vaihingen/Enz, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 411,061
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207394
Int. Cl.³ G01M 15/00
U.S. Cl. 73—118 8 Claims



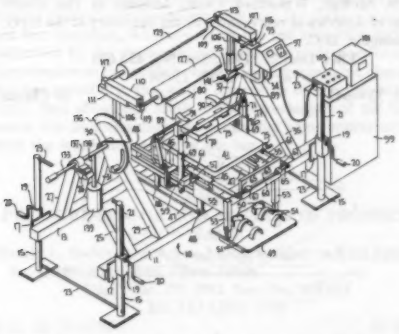
1. A method for a control device in connection with an air flow rate sensor of an internal combustion engine for the burn-off procedure of a hot wire in a constant-temperature anemometer, having a switching device for increasing the current through the hot wire relatively briefly in accordance with operating characteristics, comprising the steps of, ascertaining a spontaneously elapsing temperature increase in the vicinity of said hot wire, and controlling the course of a burnoff signal to said hot wire in accordance with said temperature increase.

4,462,252

TRUNK DYNAMOMETER

Gary L. Smidt, Iowa City, Iowa; Louis R. Amundsen, New Brighton, Minn., and Thomas B. Herring, Iowa City, Iowa, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 23, 1982, Ser. No. 422,304
Int. Cl.³ G01L 5/02
U.S. Cl. 73—379 18 Claims



1. A trunk dynamometer for measuring the isometric and concentric strength and muscular endurance of a human subject's extensor and flexor muscles used in rotating the subject's trunk about an axis of spinal flexion and extension, said trunk dynamometer comprising:

a mainframe;

torque transducer means, including an input shaft having an axis about which said shaft is rotatable, for measuring torque applied to said input shaft about said input shaft axis, said torque transducer means being secured to said mainframe;

a stabilization seat assembly mounted on said mainframe and including: a seat means for selectively engaging and immobilizing the pelvis, feet, thighs and knees of the subject when the subject is seated in said seat, and means for selectively moving said seat relative to said mainframe to permit substantial longitudinal alignment of said spinal axis with said shaft axis; and

a trunk pad assembly including first and second trunk pad members and a torque transmission shaft having first and second ends, said first and second trunk pad members extending substantially horizontally in spaced relation to engage the front and back, respectively, of the subject's trunk when the subject is seated in said seat, said torque transmission shaft being secured proximate said first end to said first and second trunk pad members and proximate said second end of said input shaft of said torque transducer means to transmit torque to said input shaft as a function of the forces applied to said first and second pad members by flexion and extension of the subject's trunk about said spinal axis.

18. A method for measuring the isometric and concentric strength and muscular endurance of a human subject's trunk about an axis of spinal flexion and extension, said method comprising the steps of:

immobilizing the pelvis, feet, thighs, and knees of the subject in a seated position; and

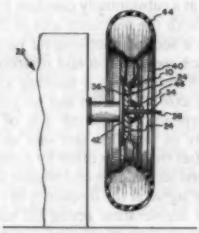
applying torque to the input shaft of a torque transducer as a function of force applied by a subject while flexing and extending his or her trunk about said axis.

4,462,253

APPARATUS FOR MOUNTING A WHEEL ON A BALANCER

Joel P. Becher, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 29, 1983, Ser. No. 508,953
Int. Cl.³ G01M 1/04
U.S. Cl. 73—487 10 Claims



1. An apparatus for mounting a wheel on a spindle having a circular backing plate coaxially attached thereto, said backing plate having a planar reference surface that is perpendicular to said axis, said wheel having a plurality of mounting holes therethrough with the centers of the mounting holes located on a mounting hole circle and symmetrically disposed around a central hole through said wheel, said mounting hole circle and said central hole having centers that are located on the axis of rotation of said wheel, said apparatus comprising:

a disk member having first and second planar surfaces, said first planar surface having a first plurality of circular recesses therein with the centers of said recesses located on a mounting circle haing the same diameter as the mounting hole circle of said wheel and being symmetrically disposed around a central bore through said disk

member in a manner identical to the manner in which the mounting holes of said wheel are disposed around the central hole through said wheel, said central bore being coaxial with said disk member and said circle having a center that is located on said axis, said central bore having a diameter such that said spindle may be inserted therethrough;

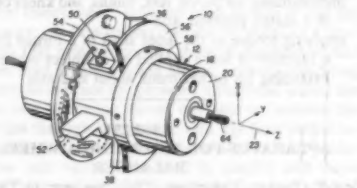
a mounting pin resiliently disposed in each of said recesses, the axes of said mounting pins being parallel to the axis of said disk member and central bore, an inwardly tapered portion of each mounting pin extending outwardly from said first planar surface to engage a mounting hole of said wheel when said spindle is inserted through said central bore such that said second planar surface engages the reference surface of said backing plate and a means for securing retains said wheel against said first planar surface.

4,462,254

SENSOR ASSEMBLY HAVING MEANS FOR CANCELLATION OF HARMONIC INDUCED BIAS FROM A TWO-AXIS LINEAR ACCELEROMETER

Billie F. Rider, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 28, 1982, Ser. No. 402,529
Int. Cl.³ G01P *15/09*
U.S. Cl. 73—510 **5 Claims**



1. A sensor assembly for measuring linear acceleration of a vehicle with respect to inertial space in a plane perpendicular to a reference axis of a vehicle, comprising:

a rotating member supported on the vehicle and driven in rotation at a substantially constant frequency about an axis parallel with the reference axis of the vehicle;

a first and a second cantilevered piezoelectric bender element, each mounted on said rotating member for rotation therewith and having a bending axis essentially parallel with the axis of rotation and an axis of sensitivity essentially perpendicular to the axis of rotation, the axes of sensitivity of said first and said second bender elements being offset from each other by a displacement angle, each of said first and said second bender elements generating an electrical signal at the frequency of rotation representative of linear acceleration acting on said vehicle in a plane normal to the axis of rotation, the electrical signal generated by said first bender element being offset in phase from the electrical signal generated by said second bender element by the displacement angle, each of which electrical signals may include an undesirable signal component at a harmonic of the frequency of rotation due to vibration of said rotating member;

first circuit means mounted on said rotating element and coupled to one of said first and said second bender elements for shifting the phase of the electrical signal generated by said one bender element by the displacement angle; and

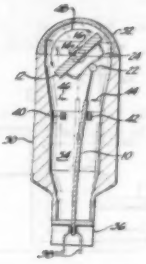
second circuit means mounted on said rotating element and coupled to said phase shifting means and to the other one of said first and said second bender elements for adding in phase the electrical signals representative of linear acceleration acting on the vehicle and rejecting the undesired signal components due to vibration of said rotating member.

4,462,255

PIEZOELECTRIC SCANNING SYSTEMS FOR ULTRASONIC TRANSDUCERS

Joe F. Guess, Littleton, and Thomas R. Kruer, Aurora, both of Colo., assignors to Technicare Corporation, Cleveland, Ohio

Filed Feb. 3, 1983, Ser. No. 463,413
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—633 **18 Claims**



1. In an ultrasonic diagnostic imaging system, apparatus for scanning the tissue of a patient, comprising:

a fluid-filled chamber, including an acoustically transparent aperture for passing ultrasonic energy;

a source of ultrasonic excitation energy;

ultrasonic energy transmission means, located in said chamber, and including an ultrasonic transducer responsive to said excitation energy, for producing a beam of ultrasonic energy which is directed toward said aperture;

a source of oscillation potential; and

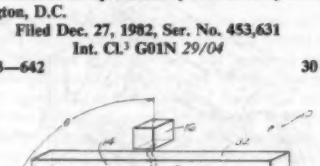
a piezoelectric bender, located in said chamber and connected to said ultrasonic energy transmission means, and responsive to said oscillation potential for deflecting said bender to cause scanning of said beam of ultrasonic energy through said aperture.

4,462,256

LIGHTWEIGHT, BROADBAND RAYLEIGH WAVE TRANSDUCER

Mark B. Moffett, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1982, Ser. No. 453,631
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—642 **30 Claims**



1. An angle-beam transducer for producing Rayleigh waves in a metal structure, comprising:

a pulse generator adapted to produce a voltage pulse;

a plurality of conductors, attached to said pulse generator, for receiving and transmitting said voltage pulse from said pulse generator;

piezoelectric polymer transducer means, attached to said plurality of conductors, for receiving said voltage pulse

from said plurality of conductors and converting said voltage pulse to a proportional strain pulse;

wedge means, surrounding and embedding said plurality of conductors and said piezoelectric polymer transducer means such that said transducer means is oriented within said wedge means at the critical angle for generating Rayleigh waves in the metal structure being tested, said wedge means being impedance matched to said transducer means thereby allowing broadband pulse generation and such that said strain pulse has a smaller dilatation wave velocity in said wedge means than the Rayleigh wave velocity in the metal structure under test; and

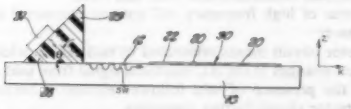
a couplant medium located between the face of said wedge means and the surface of said metal structure, for enhancing transmission of the refracted portion of said strain pulse into and along the surface of said metal structure.

4,462,257

STRAIN SENSITIVE ULTRASONIC SURFACE WAVE DETECTOR

Grant R. Gerhart, Oakland, and Douglas N. Rose, Macomb, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,523
Int. Cl.³ G01B 7/18, 17/04
U.S. Cl. 73—644 **8 Claims**



1. Mechanism for nondestructively determining physical properties of a test specimen: said mechanism comprising means (29,31) for generating an ultrasonic wave on the specimen surface, a strain-sensitive transducer (30) adhered to the specimen to be physically deformed by the generated wave, and current supply means (36) electrically connected to the transducer; said transducer comprising at least one elongated conductive-resistive bar (20); said bar having a length dimension extending normal to the general direction of wave travel on the specimen surface, a relatively large transverse width dimension (W) extending parallel to the specimen surface, and a relatively small transverse thickness dimension (T) extending normal to the specimen surface; the width dimension of the bar having extensive area conformance with the surface contour of the test specimen, whereby when the test specimen surface is deformed by the ultrasonic wave the bar undergoes compression-tension strains sufficient to produce measurable changes in the bar resistivity; the width dimension of the bar being no more than about one tenth of the wavelength of the surface wave; the thickness dimension of the bar being appreciably less than the width dimension of the bar.

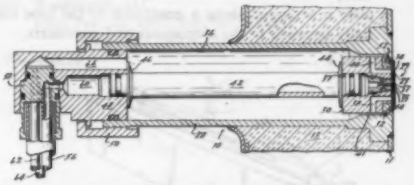
4,462,258

PRESSURE SENSOR AND METHOD OF PRODUCING SAME

Ronald L. Boddy, Ann Arbor, Mich., assignor to King Engineering Corporation, Ann Arbor, Mich.

Filed Mar. 18, 1982, Ser. No. 359,581
Int. Cl.³ G01L 7/08
U.S. Cl. 73—706 **12 Claims**

2. In a fluid pressure sensing device for measuring the pressure of a fluid in a vessel, said sensing device being adapted to be mounted in a wall of said vessel and having a diaphragm on one end thereof, the improvement wherein said diaphragm is composed of a non-elastomeric material and is secured and sealed to said sensing device by means of laser fusion in order to define the end surface thereof, said sensing device being adapted for mounting in said wall such that at least the periphery of said diaphragm is generally flush with the adjacent inside surface of said wall with a first side of said diaphragm



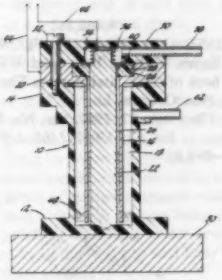
exposed to said fluid in said vessel, said sensing device including sealing means adapted to be sealingly disposed between said sensing device and said wall of said vessel.

4,462,259

PRESSURE TRANSDUCER

Donald D. Stoltman, Henrietta, and Edwin C. Storey, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1983, Ser. No. 470,137
Int. Cl.³ G01L 9/12
U.S. Cl. 73—749 **5 Claims**



1. A pressure transducer for altering an electrical parameter in response to differential pressure applied thereto, comprising:

a housing having a passage therein,

a pair of spaced pressure input ports in the passage,

a slug of magnetic liquid in the passage between the input ports for movement along the passage in response to differential pressure applied to the input ports,

means for establishing a magnetic field acting on the magnetic liquid to bias the slug of liquid toward a reference position whereby the displacement of the slug of liquid from the reference position is a measure of the pressure differential applied to the input ports, and

an electrical sensor responsive to the displacement of the slug of liquid from the reference position for controlling an electrical parameter representing pressure differential.

4,462,260

PROCESS FOR PRODUCING A CRACK IN A TUBE

Clément Lemaignan, Voreppe, France, assignor to Commissariat a l'Energie Atomique, Paris, France

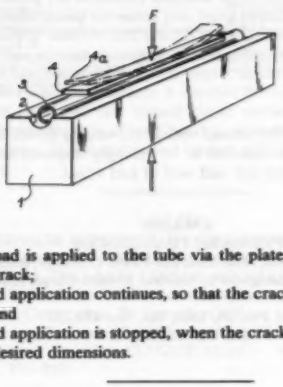
Filed Nov. 4, 1982, Ser. No. 439,306
Claims priority, application France, Nov. 19, 1981, 81 21692
Int. Cl.³ G01N 1/28
U.S. Cl. 73—799 **3 Claims**

1. A process for producing a crack on the inner face of a tube, wherein it comprises the following stages:

the tube is placed in a groove made in a support and whose shape is adapted to that of the tube in such a way that a

generatrix of the tube is in contact with a generatrix of the groove, the radius of curvature of the groove in the vicinity of the generatrix being slightly larger than that of the tube;

a plate is arranged along a generatrix of the tube substantially opposite to the aforementioned generatrix;



a load is applied to the tube via the plate, so as to start a crack;

load application continues, so that the crack can propagate; and

load application is stopped, when the crack has reached the desired dimensions.

4,462,261

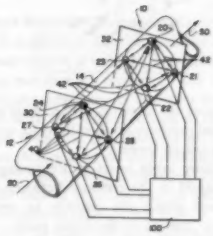
MASS AND VELOCITY FLOWMETER

Marion A. Keyes, Chagrin Falls, and William L. Thompson, Chardon, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 27, 1982, Ser. No. 372,369

Int. Cl.³ G01F *1/66, 1/86*

U.S. Cl. 73—861.02 **1 Claim**



1. A method of measuring mass flow in a fluid flowing in a conduit in a flow direction, with a first plurality of signal transmitting and receiving transducers distributed in a first plane passing through the conduit and across the flow direction, and a second plurality of signal transmitting and receiving transducers distributed in a second plane passing through the conduit and across the flow direction downstream of said first plane, comprising:

applying a signal to each of said transducers to be transmitted through the fluid;

receiving each signal of each transducer using each other transducer;

measuring the attenuation of the signals between the first plane transducers to determine the density of the fluid;

measuring the difference in signal transit times downstream and back transducers in said first plurality of transducers and transducers in said second plurality of transducers to determine the velocity of the fluid; and

utilizing the velocity measurement and the density measurement to determine the mass flow of the fluid.

4,462,262

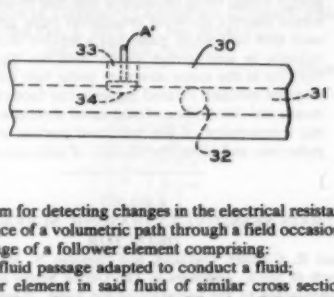
FLUID FLOW SENSING SYSTEM

Joseph Kahnke, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 31, 1982, Ser. No. 363,981

Int. Cl.³ G01F *1/70*

U.S. Cl. 73—861.05 **3 Claims**



1. A system for detecting changes in the electrical resistance or capacitance of a volumetric path through a field occasioned by the passage of a follower element comprising:

a hollow fluid passage adapted to conduct a fluid;

a follower element in said fluid of similar cross sectional shape to that of the passage and of the size slightly smaller than said passage such that the follower element is free to move along said passage, said follower element having electrical properties different from said fluid;

a single electrode current sensor disposed in said passage in electrical communication with said fluid;

a source of high frequency AC current connected to said sensor;

detector circuit means connected to said sensor which detects changes in the AC electrical signal from said sensor in the presence of said follower element wherein said detector circuit further comprises

a series resonant circuit including said source of high frequency AC current connected in series with an induction means and capacitive and resistive means associated with the flow of an electrical signal from said sensor through said fluid;

means for detecting the change in the electrical signal produced by a change in either said capacitance or resistance characteristics of said detector circuit.

4,462,263

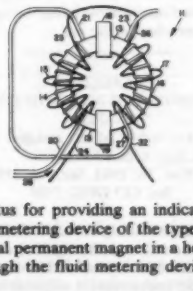
APPARATUS FOR PROVIDING AN INDICATION OF FLUID FLOW THROUGH A FLUID METERING DEVICE

Ignatius F. Bash, Huntingdon Valley, Pa., assignor to F. S. Brainard & Company, Burlington, N.J.

Filed Jan. 15, 1982, Ser. No. 339,294

Int. Cl.³ G01F *1/115*

U.S. Cl. 73—861.77 **4 Claims**



1. An apparatus for providing an indication of fluid flow through a fluid metering device of the type in which the motion of an internal permanent magnet in a housing is related to fluid flow through the fluid metering device, said apparatus comprising:

(a) excitation means for providing an AC excitation current, said excitation means including an operational amplifier having an inverting input and a non-inverting input and an output, an NPN bipolar transistor and a PNP bipolar

transistor having their bases connected together to the output of said operational amplifier and their emitters connected together so as to provide a greater excitation current, automatic gain control means for providing constant AC voltage amplitude to the junction of the emitters of said bipolar transistors, a feed back means from said bipolar transistors to said inverting input of said operational amplifier, and a source of DC current connected to said non-inverting input of said operational amplifier;

(b) a core of magnetic material having a substantially non-linear characteristic;

(c) at least two excitation windings connected to said excitation means and wound in series on said core such that their magnetic effect is additive and wherein the output of said bipolar transistor emitters is coupled to said excitation windings;

(d) at least two pick-up windings connected to each other in series and wound in such a fashion that they are in magnetic opposition to each other; and,

(e) detection means, electrically connected to said pick-up windings for producing an output signal proportional to the flow of fluid through the fluid metering device,

wherein said magnetic core, said excitation windings and said pick-up windings comprise a sensor which is mountable external of the housing for the internal permanent magnet.

4,462,264

ACOUSTIC FLOW SENSORS

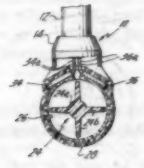
Murray F. Feller, Dunnellon, Fla., assignor to Wilgood Corporation, Dunnellon, Fla.

Continuation-in-part of Ser. No. 176,904, Aug. 11, 1980, Pat. No. 4,348,906. This application Jun. 14, 1982, Ser. No. 388,240

The portion of the term of this patent subsequent to Sep. 14, 1999, has been disclaimed.

Int. Cl.³ G01F *1/10*

U.S. Cl. 73—861.18 **14 Claims**



1. A flow sensor including a cylindrical wall defining a fluid-flow passage, a flow-metering rotor supported in said passage for rotation by fluid flowing therein, and an electrical signal generator including piezoelectric transducer means cooperating with said rotor for developing a sustained flow-representing electrical signal that is modulated in dependence on the flow-induced changes in the relationship of said piezoelectric transducer means and said rotor, said piezoelectric transducer means including at least one radial-mode piezoelectric transducer bonded to a segment of said wall so that said one piezoelectric transducer and said wall segment are coupled to each other for oscillatory stress and dimension change at least approximately along an arc of the cylindrical wall, the surface of said wall segment facing the rotor being exposed and thereby coupled to fluid in said passage.

4,462,265

MULTIPLE DEPTH WATER SAMPLING SYSTEM

Charles R. Rein, Panama City Beach, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1983, Ser. No. 470,119

Int. Cl.³ G01N *1/16*

U.S. Cl. 73—863.33 **8 Claims**

1. Apparatus for collecting water samples from a plurality of depths, said apparatus comprising:

hose means adapted to be towed substantially vertically through a body of water;

depressor means at the lower end of said hose means for keeping that end at a predetermined depth;

pump means, carried by said depressor means for pumping water from said predetermined depth through said hose means to a surface station;

modulator means at said surface station for periodically limiting flow of water at the upper end of said hose means so as to produce periodic pressure pulses in said water in said hose means along its entire length; and

a plurality of collection devices, each located at a predetermined individual depth of interest in spaced relation along said hose means, said collection devices being responsive to said pressure pulses to introduce water samples from the respective depths of interest into said hose means for transit to said surface station.

4,462,266

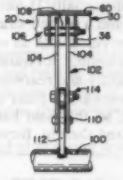
KILN FLOOR SYSTEM

Norman H. Andreasen, 1520 Norwood Ave., Itasca, Ill. 60143

Division of Ser. No. 235,656, Feb. 18, 1981. This application Dec. 1, 1982, Ser. No. 445,919

Int. Cl.³ F16H *21/44*; G05G *1/04*

U.S. Cl. 74—97 **1 Claim**



1. A dump linkage for use in a kiln floor system comprising

a tray assembly pivotally mounted about a horizontal axis for dumping a load of material and having a pair of downwardly projecting plates,

a pair of upper spaced bars having spaced upper end portions located intermediate said plates, means connecting said upper end portions to said plates of said tray assembly for pivotal movement of said upper end portion relative to said plates about a pivot axis, said connecting means fur-

ther permitting axial movement of said upper end portion relative to said plates along said pivot axis for self-compensation of any misalignment arising during movement,

a lower bar rigidly coupled to the torque transmitting shaft of a force applying device,

shaft means disposed between said upper bars, mounting said lower bar for pivotal movement on said upper pair of bars,

a portion of said lower bar extending between upper bars, and

stop means affixed between said upper bars to limit pivotal movement of said lower bar relative to said upper bars about said shaft means.

4,462,267

HANDLEBAR FOR A BICYCLE

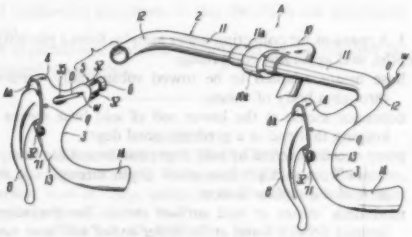
Keizo Shimano, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Feb. 18, 1981, Ser. No. 235,568

Claims priority, application Japan, Mar. 1, 1980, 55-26759; Mar. 1, 1980, 55-26760

Int. Cl.³ B62K *21/12*

U.S. Cl. 74—489 **5 Claims**



1. A handlebar for a bicycle, comprising a bar body having a mounting portion through which said handlebar is mounted on a handle stem, a pair of gripping members which have a length permitting them to be graspable by a cyclist's hands and which are positioned at both lengthwise sides of said bar body, said bar body and each of said gripping members being separate from each other, each of said gripping members having an integral support bracket for supporting a control lever, a control lever supported to each of said brackets in a position where it opposes a respective gripping member and a fixing means provided between said bar body and each of said gripping members for fixing each of said gripping members to said bar body, said bar body further comprising straight portions extending substantially horizontally from said mounting portion and first bent portions curving forwardly from ends of said straight portions respectively, each of said gripping members being formed in a substantially U-like shape and comprising a second bent portion and a second straight portion, said second bent portion being provided with an upper end opposite to said first bent portion, extending forwardly from said upper end, and curving downwardly and rearwardly, said second straight portion extending rearwardly from a lower rear end of said second bent portion, so that said bar body and each of said gripping members fixed thereto, form a drop type handlebar.

4,462,268

ANTI-TWIST THROTTLE LEVER

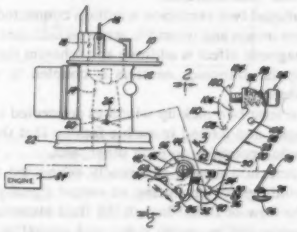
Frank W. Boeger, East Detroit, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,364

Int. Cl.³ G05G *1/04*

U.S. Cl. 74—519 **42 Claims**

1. The combination of a carburetor structure having a throttle valve carried by a rotatably positionable throttle shaft and lever means for the rotatable positioning of said throttle shaft, wherein said lever means comprises lever body means, an attachment portion carried by said lever body means, said attachment portion being effective for fixing said lever body means to said throttle shaft for causing rotatable movement of said throttle shaft upon rotatable movement of said lever body means, lever arm means carried by said lever body means as to be rotatable in unison with said lever body means, said lever arm means comprising first and second leg portions joined to each other by a bight portion as to have said first and second leg portions being spaced from and generally parallel to each



other, a linkage connecting member extending generally transversely to both of said first and second leg portions and operatively carried by each of said first and second leg portions, said linkage connecting member comprising a connecting portion adapted for connection to associated throttle actuating linkage means, said connecting portion being spaced from said first and second leg portions, and spacer means situated generally between said first and second leg portions as to prevent said first and second leg portions from relative movement toward each other beyond the distance established by said spacer means.

4,462,269

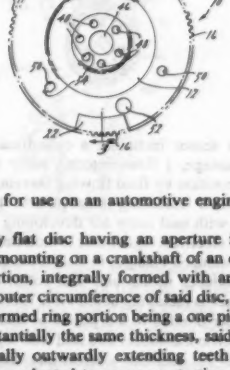
FLYWHEEL

James J. Inglis, Livonia, Mich., assignor to Davis Tool & Engineering Company, Inc., Detroit, Mich.

Continuation of Ser. No. 327,566, Dec. 4, 1981, abandoned, which is a continuation of Ser. No. 83,983, Oct. 11, 1979, abandoned. This application Nov. 10, 1983, Ser. No. 550,715

Int. Cl.³ F16C *15/00*

U.S. Cl. 74—572 **13 Claims**



1. A flywheel for use on an automotive engine or the like comprising:

(a) a generally flat disc having an aperture in the center thereof for mounting on a crankshaft of an engine;

(b) a ring portion, integrally formed with and positioned around the outer circumference of said disc, said disc and integrally formed ring portion being a one piece construction of substantially the same thickness, said ring portion having radially outwardly extending teeth of the same shape thereon adapted to engage a starting motor pinion gear on the engine; and

(c) at least one separate and distinct reinforcement member,

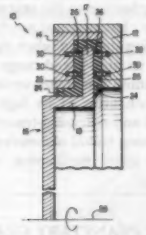
being generally in the shape of a portion of an annulus extending over only a radially outer portion of said flywheel and applied in overlapping and circumferentially aligned relationship with teeth on said ring portion to provide additional strength to said teeth on said ring portion, said reinforcement member also having radially outwardly extending teeth of the same shape thereon, said overlapping teeth on said reinforcement member being of the same shape as said teeth on said ring portion.

4,462,270

FRICTION INDEX MODIFIER FOR DAMPER

Duncan H. Cooper, and Herbert W. Egan, Jr., both of Indianapolis, Ind., assignors to Wallace Murray Corporation, New York, N.Y.

Filed Jul. 10, 1979, Ser. No. 56,392
Int. Cl.³ F16F *15/10*
U.S. Cl. 74—574 **7 Claims**



1. A torsional vibration damper of the type having a hub, an inertia ring, an elastomer member coupling the inertia ring to the hub, the hub adapted to be coupled to the crankshaft of an internal combustion engine, the elastomer member positioned between a portion of the hub and a portion of the inertia member and thereby both separating them and rotationally coupling them together, a first plurality of cavities in the elastomer member at a surface portion thereof, the cavities being filled with a viscous shear liquid, the improvement comprising, a second plurality of cavities, said second plurality of cavities also filled with a viscous shear liquid, the second plurality of cavities being in the inertia ring and located at an inertia ring-elastomer interface, whereby the total volume of viscous liquid carried by the damper is increased by the volume of the second plurality of cavities, each cavity of the second plurality of cavities being aligned with a corresponding cavity of the first plurality of cavities, whereby the total volume of shear liquid is increased without decreasing the interface area between the elastomer and the inertia ring.

4,462,271

AUTOMATIC DIFFERENTIAL CONTROL APPARATUS

Robert W. Stieg, Bethlehem, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.

Division of Ser. No. 963,284, Nov. 24, 1978, Pat. No. 4,280,583. This application Feb. 6, 1981, Ser. No. 232,362
Int. Cl.³ F16H *1/44*; B60K *17/34*; F16D *47/04*
U.S. Cl. 74—711 **7 Claims**

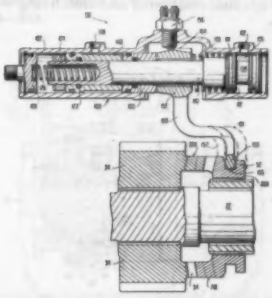
6. A three-position positive clutch for selectively controlling relative rotation between output drive shafts which extend to separate axles from a center differential driven by an input drive shaft in a multiple-drive axle vehicle, comprising:

first and second clutch members adapted for operative connection to respective drive shafts of said drive shafts wherein the second clutch member is movable relative to the first clutch member from an overrun position to engaged and disengaged positions, said clutch members including means for permitting unidirectional differential overrun in one relative rotational direction but locking the center differential to prevent differential rotation in the opposite relative rotational direction when in the overrun position and for locking the clutch members against relative rotation when in the engaged position;

cylinder means including first and second spaced coaxial cylinder portions;

main piston means operable in the first cylinder portion between advanced and retracted positions and including a piston shaft extending into the second cylinder portion, and means biasing the main piston means to the retracted position;

annular piston means slideably carried on the piston shaft and operable in the second cylinder portion between advanced and retracted positions on the piston shaft; and



clutch member moving means slideably carried on the piston shaft between the first and second cylinder portions and including means biasing the clutch member moving means toward the annular piston means, said clutch member moving means being operatively connected to the second clutch member for positioning the second clutch member in the overrun position when both of the piston means are in their retracted positions, for positioning the second clutch member in the engaged position when a selected one of the piston means is in its advance position, and for positioning the second clutch member in the disengaged position when the other piston means is in its advanced position.

4,462,272

LIMITED SLIP DIFFERENTIAL

Daniel W. Roper, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 19, 1981, Ser. No. 294,260
Int. Cl.³ F16H *1/44*; F16D *7/00, 19/00, 23/10*
U.S. Cl. 74—711 **2 Claims**

1. A limited slip differential comprising:

a rotatably mounted differential casing;

a pair of side gears rotatably mounted in said differential casing;

a plurality of planetary pinions rotatably mounted on said differential casing an in meshing engagement with said side gears;

a clutch ring being generally mounted for rotation with said differential casing and capable of axial movement between an engaged position toward one of said side gears to produce a braking force therebetween and a non-engaged position;

means for biasing said clutch ring toward said non-engaged position;

an inertial ring mounted for rotation with said differential casing and capable of circumferential movement relative thereto between a neutral position and a first actuated position;

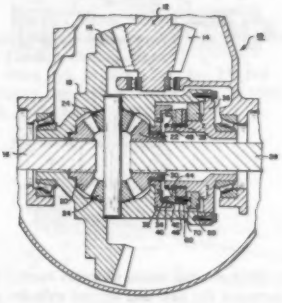
means for resisting said circumferential movement of said inertial ring from said neutral position during rotation of said differential casing in a first direction below a predetermined rate of acceleration thereof at least when said clutch ring is in said non-engaged position;

said differential casing exceeding said predetermined rate of acceleration when either of said side gears is caused to accelerate under a slipped condition;

said inertial ring having sufficient mass resisting said acceleration of said differential casing to overcome said means for resisting said circumferential movement when said differential casing exceeds said predetermined rate of acceleration to be relocated relative thereto at said first actuated position;

means for axially moving said clutch ring to said engaged position when said inertial ring is relocated at said first actuated position;

said clutch ring being in said engaged position producing said braking force between said clutch ring and said one side gear to cause rotation of said clutch ring with said one side gear;



said clutch ring and said differential casing having camming surfaces thereon which are brought into contact by said rotation of said clutch ring with said one side gear, said camming surfaces preventing further relative rotation of said clutch ring and said differential casing and forcing said clutch ring toward said engaged positionagainst said biasing as long as thrust on said differential casing is transmitted to said one side gear through said clutch ring; and

said means for axially moving said clutch ring to said engaged position including an axially aligned thrust pin means which is carried by said differential casing between said clutch ring and said inertial ring and is capable of axial movement, said thrust pin means having a first end in alignment with a cam surface of said inertial ring and a second end contacting said clutch ring, said first end being moved axially toward said clutch ring by said cam surface as said inertial ring moves from said neutral position to said first actuated position to cause said second end to move said clutch ring from said non-engaged position to said engaged position.

4,462,273

CHANGE-SPEED APPARATUS FOR A TRACTOR

Takashi Yoshii; Yasuyuki Horii, both of Sakai, and Tomeaki Tama, Hashimoto, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

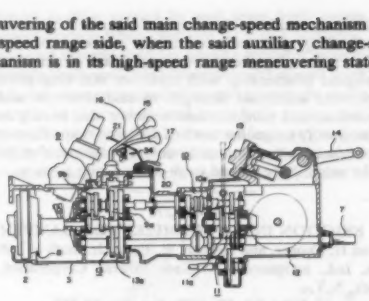
Filed Oct. 28, 1981, Ser. No. 315,770

Claims priority, application Japan, Dec. 5, 1980, 55-175082[U]; Mar. 26, 1981, 56-43295[U]

Int. Cl.³ F16H *3/02, 37/00;* **B23D** *19/00*

U.S. Cl. 74—745 **5 Claims**

1. A change-speed apparatus for a tractor, as is constructed for transmitting engine power to running travel apparatuses via a main change-speed mechanism, an auxiliary change-speed mechanism and a forward-and-rearward-travel-shifter mechanism said main change-speed mechanism, forward-and-rearward-travel-shifter mechanism and auxiliary change-speed mechanism are accommodated in a transmission casing in series one after another in the said order in fore-and-aft direction of the machine body, a mechanical restraining mechanism which prevents automatic shifting of said respective change speed mechanism said auxiliary change speed mechanism and said.forward and rearward travel shifter mechanism—to the respective states thereof as are: the state of restraining the maneuvering of the said main change-speed mechanism to its high-speed range side, when the said auxiliary change-speed mechanism is in its high-speed range meneuvering state and



when the said forward-and-rearward-travel-shifter mechanism is in the rearward running travel maneuvering state; the state of restraining the maneuvering of the said forward-and-rearward-travel-shifter mechanism to the rearward running travel, when the said auxiliary change-speed mechanism is in its high-speed range maneuvering state and when the said main change-speed mechanism is in its high-speed range maneuvering state; and the state of restraining the maneuvering of the said auxiliary change-speed mechanism to its high-speed range side, when the said forward-and-rearward-travel-shifter mechanism is in the rearward running travel maneuvering state and when the said main change-speed mechanism is in its high-speed meneuvering state.

4,462,274

SHIFTABLE PLANETARY GEAR TRAIN

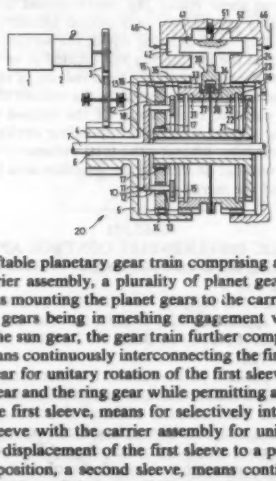
Rudi Reppert, Fiissen, and Franz X. Zaunberger, Augsburg, both of Fed. Rep. of Germany, assignors to Zahnraderfabrik Renk A.G., Augsburg, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,279

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130260

Int. Cl.³ F16H *57/10, 3/44*

U.S. Cl. 74—781 R **12 Claims**



1. A shiftable planetary gear train comprising a ring gear, a planet carrier assembly, a plurality of planet gears and a sun gear, means mounting the planet gears to the carrier assembly, the planet gears being in meshing engagement with the ring gear and the sun gear, the gear train further comprising a first sleeve, means continuously interconnecting the first sleeve and the ring gear for unitary rotation of the first sleeve relative to said ring gear and the ring gear while permitting axial displacement of the first sleeve, means for selectively interconnecting the first sleeve with the carrier assembly for unitary rotation upon axial displacement of the first sleeve to a predetermined first shift position, a second sleeve, means continuously preventing rotation of the second sleeve relative thereto while permitting axial displacement of the second sleeve, means for selectively interconnecting the second sleeve with the sun gear for preventing rotation of the sun gear upon axial displacement of the second sleeve to a predetermined second shift position, a shift element, means interconnecting the shift element for simultaneous axial displacement of both sleeves to selectively displace the sleeves axially between the first shift position

wherein the first sleeve is connected to the carrier assembly for simultaneous rotation with the carrier assembly and the second sleeve is not connected to the sun gear and the second shift position wherein the second sleeve is interconnected to the sun gear through said means for selectively interconnecting the second sleeve with said sun gear for preventing rotation of the sun gear while the first sleeve is not connected to the carrier assembly.

4,462,275

ELECTRONIC CONTROL FOR A STEPLESS VEHICLE TRANSMISSION USING A CONTROL MEMBER RESPONSIVE TO STATIC PRESSURE

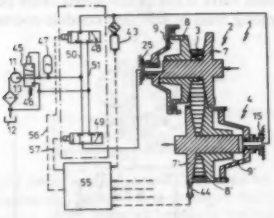
Helmut Mohl, Schwieberdingen; Manfred Schwab, Gerlingen; Joseph Sauer, Schwieberdingen; Alfred Müller, Leonberg; Heinz Leiber, Leimen, and Armin Czinczel, Schwetzingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 11, 1980, Ser. No. 186,319

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936784; Jan. 9, 1980, 3000581

Int. Cl.³ B60K *41/10*; G06F *15/50*

U.S. Cl. 74—866 **7 Claims**



1. In a continuously variable transmission for a vehicle powered by a combustion engine, a control system for adjusting transmission ratio as a function of input parameters representing load and rate of rotation which includes first (8) and second (8') positioning elements together determining the transmission ratio, wherein, in accordance with the invention, that control system includes:

first actuating means (49;71,73) for actuating said first positioning element (8) in response to hydrostatic pressure in a fluid;

second actuating means (48;70,72) constituted and operated separately from said first actuating means, for actuating said second positioning element (8') in response to said hydrostatic pressure in said fluid;

means (11,47) for providing a hydrostatic pressure in said fluid, and

an electronic control device (55) comprising computing means (60) for producing first and second electrical output signals as a function of said input parameters,

said first actuating means including at least one valve for controlling, in response to said first electrical output signal, the hydrostatic pressure provided by said pressure providing means (11,47) to a hydraulic medium input port (25) of said first positioning element (8),

said second actuating means including at least one valve for controlling in response to said electrical output signal the hydrostatic pressure provided by said pressure providing means (47) to a hydraulic medium input port (15) of said second positioning means (8'),

said at least one valve of said first actuating means and said at least one valve of said second actuating means being selectively controllable independently of each other by said electronic control device by said first and second output signals thereof.

4,462,276

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION WITH OVERDRIVE DEVICE

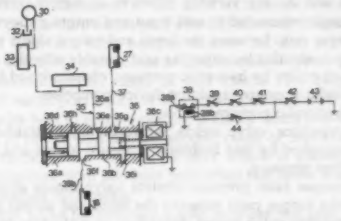
Toshio Takano, Hamuramachi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 297,889

Claims priority, application Japan, Sep. 9, 1980, 55-125436; Sep. 9, 1980, 55-125437

Int. Cl.³ B60K *41/18*; F16H *3/74, 47/08*

U.S. Cl. 74—866 **6 Claims**



1. An overdrive transmission control system in combination with an automatic transmission of a motor vehicle having a torque convertor having a turbine and provided on the automatic transmission operatively connected with an output shaft of the engine, comprising

a turbine shaft connected with the turbine of the torque convertor and extending through and beyond said automatic transmission forming an extension of said turbine shaft,

said automatic transmission including,

a main transmission having an output shaft,

a forward clutch mounted on the turbine shaft and selectively connectable with said main transmission of the automatic transmission,

a manual valve and an oil pressure regulating valve provided in said automatic transmission,

oil pump means operatively driven by the engine for pressurizing oil,

a final reduction means for operatively transmitting output torque of the forward clutch via the output shaft of the main transmission to a differential mechanism of the vehicle, and

an overdrive transmission mounted on said extension portion of said turbine shaft and including an overdrive clutch and an overdrive gear train connected to the overdrive clutch,

an intermediate shaft connected to said overdrive gear train and to said final reduction means for transmitting output torque of said overdrive transmission to said final reduction means,

overdrive valve means including a solenoid valve for selectively actuating said forward clutch and said overdrive clutch by oil pressure pressurized by said oil pump means through said manual valve and said oil pressure regulating valve provided in said automatic transmission,

switching means including, connected in series, a drive-range switch means for being turned on by shifting operation of said main transmission, a governor switch means for being turned on when the vehicle speed reaches a predetermined high value suitable for overdriving and a manually operated overdrive switch means,

said switching means for actuating said solenoid valve of the overdrive valve means so as to disengage the forward clutch and engage the overdrive clutch dependent on the turning on of all said switch means.

4,462,277

HYDRAULIC REGULATOR FOR A V-BELT TYPE CONTINUOUSLY VARIABLE TRANSMISSION FOR VEHICLES

Nobuaki Miki, No. 3-47, Okino, Noda-cho, Kariya, Aichi Prefecture, Japan, and Shoji Yokoyama, No. 1, Nakata, Kawashima-cho, Anjo, Aichi Prefecture, Japan

Filed Apr. 21, 1981, Ser. No. 256,075
Claims priority, application Japan, Apr. 30, 1980, 55-58217
Int. Cl.³ B60K *41/12, 41/16*
U.S. Cl. 74—867 5 Claims

1. A hydraulic pressure regulator in a V-belt type continuously variable transmission for vehicles having input and output pulleys mounted respectively on an input and an output shaft and having variable effective diameters, and a V-belt drivingly connected to said input and output pulleys, wherein a torque ratio between the input and output shafts is continuously controlled by adjusting said variable effective diameters of each pulley by hydraulic pressure, characterized in that said hydraulic pressure regulator device comprises

a hydraulic pressure source,

a regulator valve means for receiving hydraulic pressure supplied by said hydraulic pressure source and supplying line pressure,

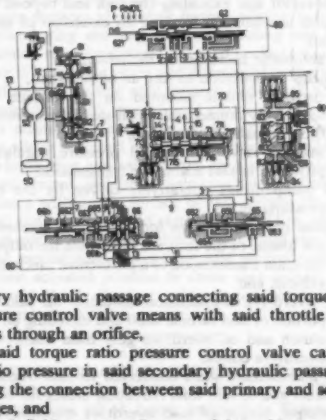
a torque ratio pressure control valve means dependent on the torque ratio between the input and output shafts,

a throttle valve means dependent on a throttle opening,

an exhaust port arranged on said throttle valve means,

a primary hydraulic passage supplying line pressure to said torque ratio pressure control valve means,

a secondary hydraulic passage connecting said torque ratio pressure control valve means with said regulator valve means,



a tertiary hydraulic passage connecting said torque ratio pressure control valve means with said throttle valve means through an orifice,

wherein said torque ratio pressure control valve causes a torque ratio pressure in said secondary hydraulic passage by controlling the connection between said primary and secondary passages, and

a feedback fluid passage at least supplying said torque ratio pressure to said torque ratio pressure control valve through an orifice of said tertiary hydraulic passage,

wherein said hydraulic pressure of said tertiary hydraulic passage is led to said exhaust port dependent on a throttle opening, and said regulator valve means causes stepwise line pressure dependent on a throttle opening by changing said torque ratio pressure.

4,462,278

TRANSMISSION FOR VEHICLES

Noboru Murakami, and Hiromi Hasegawa, both of Nagoya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 18, 1981, Ser. No. 264,816
Claims priority, application Japan, May 19, 1980, 55-66190
Int. Cl.³ B60K *41/16*
U.S. Cl. 74—868 3 Claims

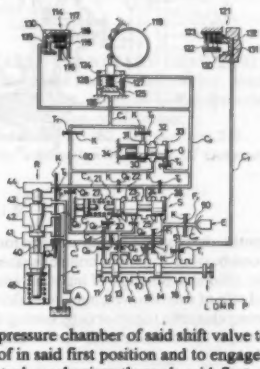
1. A transmission for vehicles, including a pressure regulator valve supplying an operating fluid of a line pressure, a torque converter, a planetary gear system, a control mechanism including at least a brake and a clutch for controlling said planetary gear system, and a hydraulic control circuit including a manual valve with at least valve positions for low- and high-speed ranges, and a shift valve forming a first and second pressure chamber with a spring-biased spool having a first position in which a biasing spring for biasing said spool is stretched to let the spool close an internal fluid passage of the shift valve and a second position in which the biasing spring is compressed to let the spool open the internal fluid passage, said transmission further comprising:

a first conduit for conducting said operating fluid of said line pressure regulated by said pressure regulator valve, being communicated with an inlet port of said manual valve and an inlet port of said first pressure chamber which urges the spool of said shift valve into said second position;

a second conduit communicating a first outlet port of said manual valve with an inlet port of the second pressure chamber which urges the spool of said shift valve into said first position; and

a third conduit communicating second outlet ports of said manual valve with an inlet port of said internal fluid passage of said shift valve;

said first and second outlet ports being communicated with said inlet port of said second pressure chamber and said inlet port of said internal fluid passage, respectively, when said manual valve is put in low-speed range position, with the operating fluid in said first conduit communicated to



the second pressure chamber of said shift valve to hold the spool thereof in said first position and to engage the brake of said control mechanism through said first conduit to form a gear train of a high reduction ratio across said planetary gear system;

said first outlet port being closed when said manual valve is put in high-speed range position, thereby communicating said second outlet ports with said inlet port of said internal flow passage to distribute the operating fluid through said internal passage of said shift valve in said second position under the influence of the fluid pressure in said first conduit and through said third conduit to disengage the brake and engage the clutch of said control mechanism, forming a gear train of a low reduction ratio across said planetary gear system.

4,462,279

1-2 SHIFT VALVE FOR AN AUTOMATIC TRANSMISSION

Koji Sumiya, Aichi, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

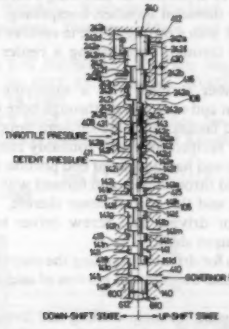
Filed Jan. 15, 1982, Ser. No. 339,808
Claims priority, application Japan, Jan. 19, 1981, 56-6846
Int. Cl.³ B60K *41/04, 41/12*
U.S. Cl. 74—868 28 Claims

1. A 1-2 shift valve in a housing for an automatic transmission, said 1-2 shift valve being adapted to operate corresponding to governor pressure counteracting a throttle pressure and a detent pressure employed in a kickdown operation, said

transmission being capable of shifting up from a first speed range to a second speed range as well as shifting from the second speed range to the first speed range under control of said 1-2 shift valve, comprising:

a housing; and

a spool contained within said housing, said spool comprising a first spool element and a second spool element, the first spool element having a first pressure receiving surface for receiving one of said throttle pressure and said detent pressure, said spool being actuatable between first and second speed positions in said housing, said spool when at said first speed position thereof being constructed and arranged to shut off said detent pressure from said first pressure receiving surface and to receive said throttle pressure on said first pressure receiving surface, said spool when at said second speed position thereof being constructed and arranged to shut off said throttle pressure



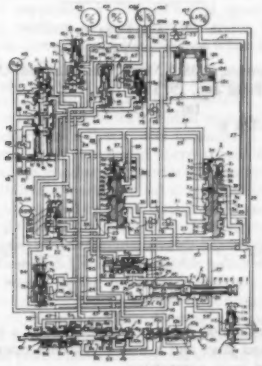
from said first pressure receiving surface and receive said detent pressure on said first pressure receiving surface, said second spool element having a second pressure receiving surface element for receiving said governor pressure and permitting said spool to be displaced to said second speed position.

4,462,280

MANUAL VALVE FOR HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kazuhiko Sugano, and Kunio Ohtsuka, both of Yokohama, Japan, assignors to Nissan Motor Co., Limited, Yokohama, Japan

Filed Feb. 16, 1982, Ser. No. 349,307
Claims priority, application Japan, Feb. 17, 1981, 56-20826
Int. Cl.³ B60K *41/08, 41/12*
U.S. Cl. 74—868 **6 Claims**



1. A hydraulic control system for an automatic transmission including a first friction unit to be engaged for all of forward drive ranges, a second friction unit, and a third friction unit, comprising:

a pressure regulator valve for producing a line pressure in a fluid conduit;

a manual valve;

said manual valve including a housing having a wall defining a bore and a spool slideably disposed within said bore for movement to a parking range, a reverse range, a neutral range, an automatic drive range, a manual second range and a manual first range;

said housing being formed with an inlet port connected to said pressure regulator valve through said fluid conduit, a first outlet port which is allowed to communicate with said inlet port when said spool is set to said reverse range and which is connected to said third friction unit, a second outlet port, a third outlet port which is allowed to communicate with said inlet port to receive the line pressure when said spool is set to one of said automatic drive range, said manual second range or said manual first range, a fourth outlet port which is allowed to communicate with said inlet port to receive the line pressure when said spool is set to one of said manual second range or said manuel first range, and a fifth outlet port which is allowed to communicate with said inlet port when said spool is set to said manual first range;

a first shift valve for effecting a shift between one gear ratio and another gear ratio, said first shift valve having an inlet port connected to said third outlet port, an outlet port connected to said second friction unit and a drain port, said first shift valve being shiftable between a downshift state wherein said outlet port thereof is isolated from said inlet port thereof and is allowed to communicate with said drain port and an upshift state wherein said outlet port thereof is allowed to communicate with said inlet port thereof and is isolated from said drain port thereof;

a second shift valve for effecting a shift between said another gear ratio and still another gear ratio, said second shift valve having an inlet port, an outlet port connected to said third friction unit, and a drain port, said second shift valve being shiftable between a downshift state wherein said outlet port thereof is isolated from said inlet port thereof and is allowed to communicate with said drain port, and an upshift state wherein said outlet port is allowed to communicate with said inlet port and is isolated from said drain port,

said second outlet port of said manual valve being allowed to communicate with said inlet port when said spool is set to one of said automatic drive range, said neutral range and said reverse range, but being drained when the spool is set to said parking range, said manual second range and said manual first range, said second outlet port being connected to said inlet port of said second shift valve.

4,462,281

BOLT HOLDING WRENCH

James A. Zils, Parma, Ohio, assignor to Russell, Burdsall & Ward Corporation, Cleveland, Ohio

Filed Oct. 21, 1982, Ser. No. 435,716
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—56 **14 Claims**

1. An end drive power wrench comprising a wrench housing assembly, power means in said wrench housing assembly,

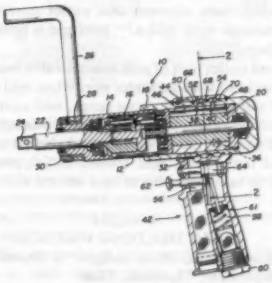
including a motor, a tubular drive member journaled in said wrench housing assembly for rotation by said motor about an axis of rotation, said wrench housing assembly including an end portion located along said axis at the end thereof opposite said drive member, said end portion providing a cylindrical opening substantially coaxial with said axis of rotation and an internal recess adjacent said opening providing a radially extending surface, an adapter housing assembly mounted on said end portion including an adapter ring providing a cylindrical portion extending through said cylindrical opening with a close fit and a flange mating with said radially extending surface to lock said adapter ring against axial movement in at least a direction away from said drive member, said wrench housing assembly and said adapter assembly including mating axially extending surfaces operable to prevent rotation between said adapter ring and said wrench housing assembly, an elongated bit rod extending along said axis through said adapter ring and drive member, non-circular mating surfaces on said adapter housing and said bit rod preventing rotation of said bit rod relative to said adapter ring while allowing axial movement of said bit rod relative to said drive member, and spring means in said adapter housing assembly resiliently biasing said bit rod in an axial direction toward said drive member and allowing axial movement in the opposite direction, said drive member being operable to rotate a first threaded fastener while said bit rod engages a second threaded fastener and prevents rotation of said second threaded fastener while said drive member produces rotation of said first fastener.

4,462,282

POWER TOOL WITH TORQUE REACTION BAR

Paul A. Biek, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 15, 1982, Ser. No. 441,691
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.11 **6 Claims**



1. An improved power tool for performing an operation on a work piece, said tool comprising:

a hollow housing;

motor means located in said housing and including a rotatable tool drive shaft projecting from said housing;

torque reaction means attached to said housing for preventing rotation of said housing relative to said work piece while an operation is being performed on said work piece; and

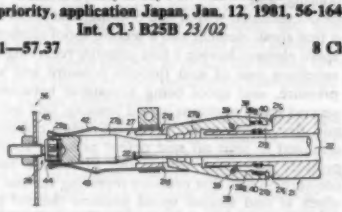
handle means including a bore rotatably receiving said hollow housing, whereby said handle means can be positioned as desired relative to said housing and whereby torque cannot be imposed on said handle means by said housing.

4,462,283

SCREW DRIVER APPARATUS

Yoshikazu Ito, Sagamihara, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 22, 1981, Ser. No. 333,452
Claims priority, application Japan, Jan. 12, 1981, 56-1640[U]
Int. Cl.³ B25B *23/02*
U.S. Cl. 81—57.37 **8 Claims**



1. A screw driver apparatus for screwing a threaded fastener into an internally threaded member, comprising:

a casing formed with a through bore to receive said threaded fastener, the through bore having a center axis passing therethrough,

a tubular member formed with a supplying passageway having a front end open to said through bore for supplying said threaded fastener into the through bore,

a screw driver reciprocably and rotatably received in said through bore and having a front end portion to be slidably guided by said through bore and formed with a depression for retaining said threaded fastener therein,

drive means for driving said screw driver to rotate and having an output shaft,

coupling means for drivably coupling the output shaft of said drive means and the rear end portion of said screw driver, and

reciprocating means for reciprocating said screw driver with respect to said casing between a first axial position where said front end portion of said screw driver projects outwardly from said casing to force said threaded fastener to be screwed into said internally threaded member, and a second axial position where said front end portion of said screw driver is positioned rearwardly of said front end of said supplying passageway to allow said threaded fastener to be supplied into said casing through said supplying passageway,

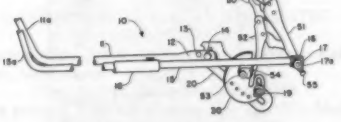
wherein said screw driver has a longitudinally intermediate portion smaller in diameter than the through bore, the longitudinally intermediate portion being located at the front end portion of said through bore of said casing when the leading end of the threaded fastener reaches said internally threaded member, to cause said screw driver to be inclinable with respect to said center axis of said through bore.

4,462,284

TOOL EXTENSION

Ronald B. Gowers, 1938 N. 1690 West, Layton, Utah 84041

Filed Jan. 19, 1983, Ser. No. 459,154
Int. Cl.³ B25B *7/02*
U.S. Cl. 81—428 R **11 Claims**



1. A tool extension for remote operation of a tool having a pair of pivoted jaws and a pair of handles operatively connected to said jaws, comprising:

a. a first rod pivotally connected at one end thereof to a first

said handle of said tool, for remote movement of said first handle by movement of said rod along a direction parallel to its length;

b. a lever;

c. a connecting plate attached to the second said handle, substantially in a plane defined by said handles, said connecting plate pivotally connected to a first end of said lever at a location eccentric to the location of attachment of said second handle;

d. a second rod pivotally connected to the second end of said lever; and

e. means for restraining said first and second rods to closely spaced relative parallel movement along respective directions substantially parallel to said plane.

4,462,285

POWER TOOL MARKING SYSTEM

Antony R. Wiltshire, Kettering, England, assignor to Ford Motor Company, Dearborn, Mich. and Desitech Limited, England

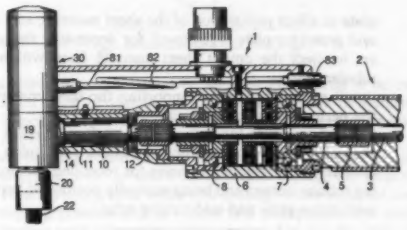
PCT No. PCT/GB82/00032, 371 Date Sep. 30, 1982, 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02684, PCT Pub. Date Aug. 19, 1982

PCT Filed Feb. 11, 1982, Ser. No. 429,367

Claims priority, application United Kingdom, Feb. 11, 1981, 8104216

Int. Cl.³ B25B *23/14*

U.S. Cl. 81—468 6 Claims



1. A power tool adapted to engage, torque and mark a threaded fastener comprising:

means for engaging said fastener;

means for rotating said engaging means about an axis;

means for marking said fastener when said fastener is torqued a predetermined amount, wherein said marking means comprises a marking stylus mounted for reciprocal movement with respect to said engaging means into and out of contact with said engaged fastener;

means for supplying a predetermined quantity of liquid marking medium to said marking stylus for discharge therefrom directly onto said fastener when said fastener is torqued a predetermined amount;

means for reciprocally moving said marking stylus into and out of contact with said engaged fastener;

said marking means includes a central bore and said marking stylus comprises a first piston mounted in said bore for reciprocal linear movement therein, said first piston includes a first conduit for conducting marking fluid along its length and a marking head at one end of said conduit for contacting said engaged fastener when said first piston is moved to a second position within said bore;

said supplying means includes a reservoir for storing a quantity of said liquid marking medium under pressure and a second piston having one end extending into said reservoir, being mounted in said bore for reciprocal linear movement therein and for defining a chamber between said first and second pistons at its other end;

said second piston includes a second conduit for conducting said liquid marking fluid from said reservoir to said chamber and a valve means for preventing reverse flow of said marking medium within said second conduit, whereby reciprocal movement of said first and second pistons causes liquid marking medium to be pumped from said reservoir via said chamber to said marking head.

4,462,286

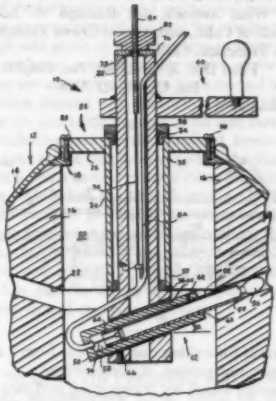
PORTABLE SLOTTING DEVICE

Herman H. Erhard, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1982, Ser. No. 452,605

Int. Cl.³ B23B *41/06*

U.S. Cl. 82—1.4 5 Claims



1. A portable slotting device comprising:

a housing for attachment to an object, said object having a longitudinal bore therein, said housing including a mounting flange through which attaching means secure said housing to said object and a guide fixedly attached to said mounting flange, said guide extending downwardly into said bore in said object;

means for cutting a slot, said cutting means being rotatably secured to said housing, said cutting means able to form a conical slot in said object, said means for cutting including a drive shaft and a telescoping arm for cutting, said telescoping arm attached to said drive shaft, said drive shaft rotatably secured in said housing by bearing means, said drive shaft longitudinally locked into said housing by locking means secured to said bearing means, said drive shaft having an angled bore therein at a lower end for fixedly holding said telescoping arm in said drive shaft, and said drive shaft having a longitudinal bore therein, said telescoping arm for cutting further comprises an arm housing with a cavity running longitudinally therethrough with an opening in a front end of said arm housing, said arm housing having means for receiving pressurized fluid in a rear end; a first extension arm of tubular shape in sliding contact with said arm housing in said cavity, said first extension arm having a first pressure sealing means on a lower end in contact with said arm housing in said cavity, said first extension arm having a first pressure sealing means on a lower end in contact with said arm housing, said first extension arm having a first guide slot for receiving a first guide pin secured therein; a second extension arm, being rod shaped, in sliding contact within said tubular shape of said first extension arm, said second extension arm having a second pressure sealing means on a lower end in contact with said first extension arm, said second extension arm having a second guide slot horizontally positioned therein for receiving said second guide

pin; and a cutter fixedly attached to said second extension arm, whereby pressurized fluid fed into said cavity of said arm housing causes said first and said second extension arms to be translated from said opening in said arm housing so that said cutter doesn't rotate relative to said arm housing and can translate a maximum predetermined distance from said arm housing;

means secured to said cutting means for rotating said cutting means; and

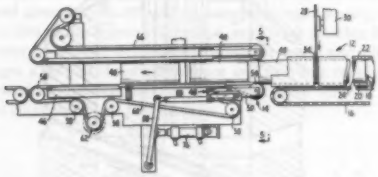
means for controlling the depth of said slot, said controlling means attached to said cutting means.

4,462,287

APPARATUS FOR CULLING CANT ENDS

Rudolf R. Weis, Antioch, and Rudolph W. Schutz, Walnut Creek, both of Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Dec. 2, 1982, Ser. No. 446,302
Int. Cl.³ B26D *7/18*
U.S. Cl. 83—104 **3 Claims**



1. Apparatus for culling cant ends cut from a cant at a cant cutting station comprising, in combination:

first conveyor means for transporting said cant endwise past said cutting station whereat said cant is cut into individual roll segments of a predetermined length and cant ends;

second conveyor means positioned downstream from said first conveyor means for receiving said roll segments and transporting said roll segments to a predetermined location; and

means for forming a gap between said first and second conveyor means at the time said cant ends are positioned for transfer from said first conveyor means to said second conveyor means whereby said cant ends will fall through said gap and not be transferred to said second conveyor means, said first conveyor means including two conveyor sections mounted for relative movement, and said gap forming means including prime mover means for moving one of said conveyor sections relative to the other of said conveyor sections to form said gap, each of said sections including sheave means and means for rotatably supporting said sheave means, said first conveyor means further including unitary belt means disposed about sheave means on both said conveyor sections, said sheave means adapted to maintain said unitary belt means under continuous tension during relative movement between said conveyor sections.

4,462,288

PUNCH PRESS APPARATUS FOR PERFORATING EXPLOSIVE SHEETS

Gary L. Boyce, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1983, Ser. No. 488,245
Int. Cl.³ B26F *1/44*
U.S. Cl. 83—128 **4 Claims**

1. A punch press apparatus for perforating explosive sheet material, which comprises in combination:

a cutter plate means containing multiple tubular cutters with annular cutting edges mounted therein, wherein each of said cutters projects below said plate and contains a plunger for ejecting cutout sheet material therefrom, said plunger comprising a forward end for ejecting said cutout material and a rearward end projecting above said cutter plate and containing a resilient biasing means for retracting said plunger;

a protector plate means removably disposed above said cutter plate, for contacting the cutter plate without operating said plungers;

a plunger ejection plate means disposed above said protector plate, for pressing said protector plate onto the cutter

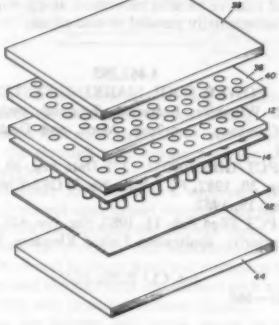


plate to effect perforation of the sheet material, and when said protector plate is removed, for depressing the plungers to eject the cutout sheet material from within said tubular cutters;

an anvil means for rigidly supporting the sheet material in the perforating operation; and

a guide plate means for stripping the perforated sheet from the outer surface of the tubular cutters, said guide plate containing corresponding holes for receiving the projecting tubular cutters and being normally positioned between said cutter plate and said cutting edge.

4,462,289

MATERIAL CUTTING APPARATUS FOR CUTTING SEGMENTS HAVING POINTED ENDS FROM A STRIP OF MATERIAL

Volker Schmidt, 4638 Todds Rd., Lexington, Ky. 40509

Filed Sep. 16, 1982, Ser. No. 418,755
Int. Cl.³ B26D *5/22*
U.S. Cl. 83—217 **16 Claims**

1. A material cutting apparatus for cutting a strip of material into segments of a selected length with each segment having pointed ends including:

feed means to feed the strip of material past a cutting location;

cutting means to cut the fed material at the cutting location into the segments;

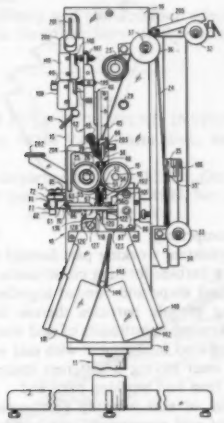
movably mounting means to movably mount said cutting means for movement between first and second cutting positions at the cutting location;

controlling means controlling said feed means and said cutting means to stop feed of the strip of material by said feed means before said cutting means cuts the strip of material to cut a segment of material and to start feed of the strip of material by said feed means after said cutting means has cut the fed material with said cutting means in each of its first cutting position and its second cutting position at the cutting location so that said cutting means has completed cutting the segment of material;

first activating means to activate said cutting means when said cutting means is in one of its first and second cutting positions to cut the strip of material at a first angle other than orthogonal to its feed path and to activate said cut-

ting means when said cutting means is in the other of its first and second cutting positions to cut the strip of material at a second angle other than orthogonal to its feed path and to the first angle of the cut produced by said cutting means at said one cutting position;

second activating means to move said cutting means between its first and second cutting positions to enable cutting of the strip of material at the first and second angles to form a pointed end;



clamping means to clamp the segment of material to be cut from the strip of material to hold the segment of material in position after it is cut by said cutting means when said cutting means is in said one cutting position;

and clamping control means to render said clamping means effective prior to said cutting means cutting the strip of material a first time when said cutting means is in said one cutting position and to render said clamping means ineffective only after said cutting means has cut the strip of material a second time when said cutting means is in said other cutting position.

4,462,290

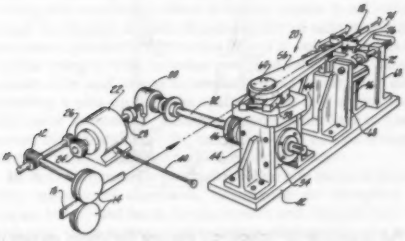
TUBE CUT-OFF MACHINE

Bernard J. Wallis, 25315 Kean Ave., Dearborn, Mich. 48124

Filed Oct. 27, 1982, Ser. No. 437,135

Int. Cl.³ B26D *1/56*

U.S. Cl. 83—311 **3 Claims**



1. In a strip forming mill of the type including a shaft for rotating rolls which form and/or drive the formed strip axially, a mechanism for cutting the formed strip into successive segments of predetermined length while it is being so driven comprising a drive unit having mechanically connected input and output shafts so that the output shaft rotates at all times at a speed proportional to a high degree of accuracy to the speed of the input shaft, means mechanically interconnecting said input shaft with said roll driving shaft for rotation in unison, a base, a slide mounted for reciprocation on said base in the path of travel of the formed strip, means mechanically interconnecting the output shaft of the drive unit with said slide for reciprocating the slide through a predetermined stroke, said last-mentioned means including a mechanical device for causing the slide to move at a uniform speed through at least one portion of its stroke, means for adjusting the speed of the output shaft of the drive unit relative to its input shaft such that the slide moves at exactly the same speed as the formed strip during said portion of its stroke, guide means on said slide through which the tube is adapted to move, a cut-off blade mounted for reciprocation on said slide across said guide for severing a segment off the end of the formed strip and mechanical means operated in response to reciprocation of the slide for causing the blade to move through said guide in one direction to sever the formed strip during said one portion of the stroke of the slide, said mechanical means comprising a cam track on said base extending in a direction aligned with the path of travel of the slide, a cam follower on said blade engaged with said cam track, said cam track including one portion inclined toward the slide which is engaged by the cam follower when the slide is moving in one direction and a second portion extending parallel to the stroke of the slide when the slide is moving in the opposite direction, said inclined portion of the track being defined in part by a lever supported for pivotal movement about an axis perpendicular to the path of travel of the slide, said lever having its free end normally engaging said second portion of the cam track to pivot to an out-of-the-way position when the slide is moving in said opposite direction.

4,462,291

PUNCHING OR PRESSING MACHINE

Jürgen Schulz, Bergiusstrasse 32-34, Berlin 44, Fed. Rep. of Germany (D-1000)

Filed Mar. 31, 1981, Ser. No. 249,378

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 3012486

Int. Cl.³ B26D *5/02, 5/16*

U.S. Cl. 83—368 **14 Claims**

1. In a punching or pressing machine for punching or pressing sheet material having a support base, a stationary machine member rigidly attached to said base, a movable machine member supported between said base and stationary member for reciprocating movement with respect thereto, a punching or pressing tool mounted on at least one of said stationary or movable machine members, a wedge shaped member mounted between said support base and said movable machine member for reciprocating movement in a direction substantially transverse to the reciprocating movement of said movable member so that movement of said wedge member produces said reciprocating movement of said movable member, drive means operably connected between said support base and said wedge member to reciprocate said wedge member relative to said support base and said movable member, and hardened load bearing surfaces on the faces of said wedge member and the adjacent cooperating faces of said support base and movable member, the improvement comprising, all said load bearing surfaces have substantially the same area, and each said surface is a hardened body-surface comprised of a layer of closely

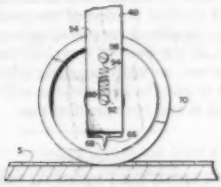
spaced hard bodies having a circular cross-sectional shape embedded in a matrix of solidified synthetic resin, the outer surface of said layer being flat and formed by flat coplanar faces of said hard bodies and matrix, said flat faces of said hard bodies being substantially circular in shape and positioned inwardly from the original outer surface thereof 25% to 50% of the diameter of said cross-section.

4,462,292

APPARATUS FOR CUTTING AND NOTCHING SHEET MATERIAL

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Jun. 14, 1982, Ser. No. 388,229
Int. Cl.³ D06H *7/02*
U.S. Cl. 83—471.2 **12 Claims**



1. Apparatus for cutting limp sheet material along a cutting path defined by a pattern piece and forming notches in the sheet material along the cutting path, comprising:

support means defining a support surface on which sheet material is spread for cutting;

a cutting head including a first cutting tool in the form of a cutting wheel rotatable about an axis extending generally parallel to the support surface and with a peripheral cutting edge which rolls on the support surface of the support means along a cutting path in cutting engagement with the sheet material spread on the surface, the head further including a second cutting tool in the form of a notcher mounted axially adjacent the wheel for movement toward and away from the support surface and movement with the cutting wheel along the cutting path, the notcher having a cutting edge for effecting a notch in the sheet material adjacent the location of the wheel along the cutting path as the notcher moves toward and away from the support surface and as the cutting edge of the notcher moves into and out of cutting relationship with the sheet material on the support surface;

controlled translating means connected with the cutting head and the support means for controllably moving the cutting wheel and notcher parallel to the support surface along a desired cutting path;

controlled rotating means also connected with the cutting head for turning the cutting wheel and the axially adjacent notcher jointly about an axis perpendicular to the support surface to enable the wheel and notcher to translate along a cutting path defined by a pattern piece; and

actuating means connected to the notcher for moving the notcher toward and away from the support surface and the cutting edge of the notcher into and out of cutting relationship with the sheet material to effect a notch in the sheet material adjacent the cutting path of the wheel as the material is pressed between the cutting edge of the notcher and the support surface.

4,462,293

WEAR-RESISTANT AND SHOCK-RESISTANT TOOLS AND METHOD OF MANUFACTURE THEREOF

Fred G. Gunzner, 879 W. Main, Silverton, Oreg. 97381

Filed Sep. 27, 1982, Ser. No. 423,707
Int. Cl.³ B23D *61/04, 65/00*
U.S. Cl. 83—855 **11 Claims**

1. A tool comprising:

(a) a wear-resistant working part formed of steel powders, containing carbide-forming constituents, compressed into a preformed shape and bonded together by heating and containing carbide particles therein formed from said carbide-forming constituents of said steel powders;

(b) a body of steel in abutment with said working part, said body of steel having a different composition of lesser hardness than said working part; and

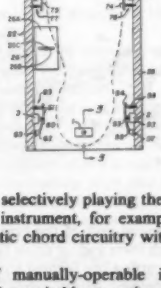
(c) a portion of said working part, constituting a minor fraction of said compressed and bonded steel powders, and an abutting portion of said body being fixedly fused with each other by melting and diffusion into each other of both of said portions while in abutment with each other, and subsequent cooling thereof.

4,462,294

CONTROL UNIT FOR AN ELECTRICAL MUSICAL INSTRUMENT

Ted Kazimer, Box 3, Site 10, R.R. #1, Hixon B.C. V0K 1S0, Canada

Continuation-in-part of Ser. No. 210,946, Nov. 28, 1980, abandoned. This application Oct. 6, 1982, Ser. No. 433,151
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **15 Claims**



1. An apparatus for selectively playing the chord section of an electrical musical instrument, for example, an electronic organ, having automatic chord circuitry with "n" number of chords comprising:

(a) a plurality of manually-operable individual chord switches mounted on suitable mounting means in selected spaced apart relation relative to one another around a defined area;

(b) a multi-position selector switch means switchable from

one to another of a plurality of different positions and comprising a plurality of switches ganged together to operate in unison and connected to the chord circuitry so as to provide a different pre-selected combination of chords less than "n" at the respective different positions of the selector switch, said individual chord switches being operatively connected through the selector switch so as to permit individually activating each of the respective ones of the different chords in the preselected combination at each of the different positions of the multi-position selector switch; and,

(c) means connecting said multi-position selector switch to the automatic chord circuitry of the electrical musical instrument.

4,462,295

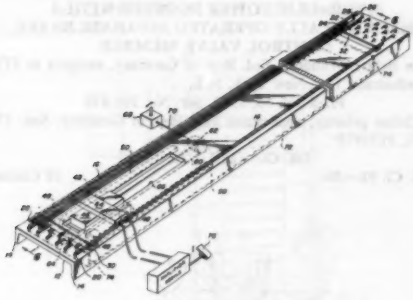
BEAM AND CYLINDER SOUND INSTRUMENT

Craig R. Hundley, 14244 Valley Vista Blvd., Sherman Oaks, Calif. 91423

Continuation-in-part of Ser. No. 195,433, Oct. 9, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 409,985

Int. Cl.³ G10H *3/00*

U.S. Cl. 84—1.16 **12 Claims**



1. An instrument for producing sound effects made substantially entirely of aluminum, comprising an elongated flat topped beam, said beam having a web and integral side legs with the cross-section shape being substantially the same throughout most of the beam's length, a plurality of string supports at one end of said beam and a cooperating plurality of string holding and tensioning means at the other end of said beam, a plurality of strings formed of solid wire, each string respectively being stretched from said supports at said one end of the beam to said holding and tensioning means at said other end of said beam, separate bridge means at each end of said beam for holding said strings spaced above said web, said holding and tensioning means including means to individually adjust the tension of each of said respective strings, a hollow aluminum cylindrical tube means closed at one end and having a collar integral with its other end, said tube means being in contact with said strings to produce sound effects, and means including a pick-up between said web and said strings that is responsive to vibratory motion produced from time to time in certain combinations or the individual ones of said strings to produce various kinds of audible sound effects.

10. An instrument for producing sound effects made substantially entirely of aluminum, comprising an elongated flat topped beam, said beam having a web and integral side legs with the cross-section shape being substantially the same throughout most of the beam's length, said web having an opening therein, a plurality of string supports at one end of said beam and a cooperating plurality of string holding and tensioning means at the other end of said beam, a plurality of strings formed of solid wire, each string respectively being stretched from said supports at said one end of the beam to said holding and tensioning means at said other end of said beam, separate bridge means at each end of said beam for holding said strings spaced above said web, said holding and tensioning means including means to individually adjust the tension of each of said respective strings, means including a pick-up between said web and said strings that is responsive to vibratory motion produced from time to time in certain combinations or the individual ones of said strings to produce various kinds of audible sound effects, a movable car projecting through said web opening and carrying said pick-up, and a reversible and variable speed drive means for causing said car and pick-up to move while said instrument is being played.

4,462,296

DRUMSTRICK FOR PLAYING PERCUSSION INSTRUMENTS

Ronald E. Heiskell, 2632 Mallard Ct., Union City, Calif. 94587

Filed Jan. 24, 1983, Ser. No. 460,672

Int. Cl.³ G10D *13/02*

U.S. Cl. 84—422 S **6 Claims**

1. A drumstick comprising an elongate handle portion, a tapered fore portion shorter than said handle portion and integral with said handle portion, a striking head on the end of said tapered portion, and a series of minute circumferentially extending ridges and grooves from 177 to 635 per inch along said handle portion for providing a relatively even surfaced non-slip hand gripping surface on said handle portion.

3. A drumstick comprising an elongate handle portion, a tapered fore portion shorter than said handle portion and integral with said handle portion, a striking head on the end of said tapered portion, a rounded butt end portion on the back end of the drumstick, a relatively thick coating of a moisture impervious plastic on said tapered fore portion and on said butt end portion, and a relatively thin coating of a waterproof substance on said handle portion for allowing a tactile effect of the surface roughness of the handle portion to be apparent to the user of the drumstick.

4,462,297

ELECTRONIC METRONOME

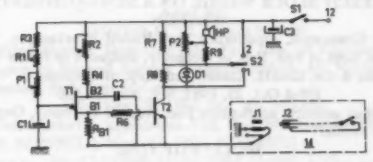
Etienne Dill, and Pascal Dill, both of 5, rue Kleber, 93500 Pantin, France

Filed May 14, 1981, Ser. No. 263,583

Claims priority, application France, May 22, 1980, 80 11466

Int. Cl.³ G10B *15/00*

U.S. Cl. 84—484 **8 Claims**



1. An electronic metronome for producing bips at a predetermined frequency comprising an oscillator circuit, means operably connected to said oscillator circuit for adjusting the frequency of said oscillator circuit, means operably connected to the output of said oscillator circuit for generating audible and/or visual bips and a pedal-type synchronized remote control unit, operably connected to trigger said oscillator circuit, said oscillator circuit comprising a uni-junction transistor hav-

ing a base, and a capacitor, said base being operably connected to said remote control unit through said capacitor.

4,462,298

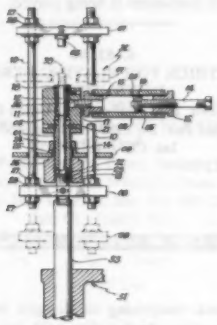
BULLET SIZING ATTACHMENT FOR ARBOR-TYPE PRESS

John D. Engles, P.O. Box 3782, Chula Vista, Calif. 92011

Filed Dec. 13, 1982, Ser. No. 449,398

Int. Cl.³ F42B *31/02*

U.S. Cl. 86—19 5 Claims



1. For an ammunition reloading press having a shell-holding pedestal with means to engage a shell thereon, actuator means for selectably raising and lowering said pedestal, and a bridge member defining a die socket spaced above and aligned with said pedestal, a bullet sizing attachment comprising:

(a) a bullet sizing die and means for engaging same in said socket to be loaded from above and having a bore through the bottom to pass a bullet ejecting plunger therethrough;

(b) a frame mountable to said pedestal to move therewith, and a portion thereof extending over said die and mounting a depending punch for forcing a bullet into said die;

(c) said frame also mounting a plunger above said pedestal for passing through said bore to eject a bullet from said die, whereby when said pedestal is forceably lowered, said punch forces a pre-positioned bullet into said die, and when said pedestal is raised, said plunger ejects said bullet from said die;

(d) said frame comprising a pair of strain-bearing upright rods mounted together in spaced parallelism by upper and lower crossbars, and said lower crossbar being mountable on said pedestal such that said upright rods carry the stress of forcing said bullet into said die with said plunger.

4,462,299

MECHANISM THAT AUTOMATICALLY OPENS THE BREECH BLOCK WEDGE ON A SEMI-AUTOMATIC WEAPON

Peter Grunewald, Fuldabruck, and Rudolf Brockmeyer, Vellmar, both of Fed. Rep. of Germany, assignors to Firma Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

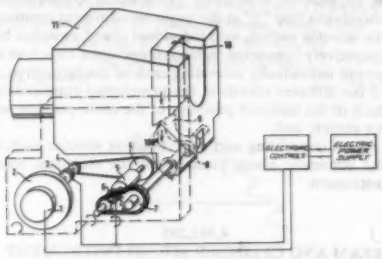
Filed Oct. 25, 1982, Ser. No. 436,500

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142457

Int. Cl.³ F41F *11/02*

U.S. Cl. 89—24 11 Claims

1. In a semi-automatic weapon receptive of a preselected caliber ammunition and having a breech and a breech block wedge which opens upon recoil by the preselected caliber ammunition, the improvement comprising a mechanism for automatically opening the breech block wedge when a training liner and less than said preselected caliber ammunition is used in the weapon, the mechanism comprising an electromechanical drive mechanism connected to the breech block wedge and including one mechanical opening means engaging the breech block wedge and having a drive shaft for actuating same, an electric motor with a drive shaft that is rigidly connected to an



energy-saving flywheel and at least one adjustable coupling between the flywheel and the drive shaft of the mechanical opening means.

4,462,300

HYDRAULIC POWER BOOSTER WITH A MECHANICALLY OPERATED SEPARATE BRAKE CONTROL VALVE MEMBER

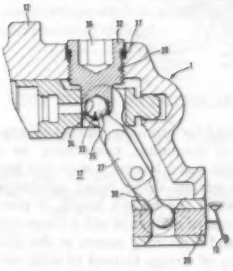
Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,475

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3136975

Int. Cl.³ F15B *9/10, 13/10*

U.S. Cl. 91—384 19 Claims



1. A hydraulic power booster arrangement for use in conjunction with an auxiliary source of pressurized hydraulic fluid and with an unpressurized reservoir, particularly in vehicle braking systems for actuating master cylinder units, comprising:

a housing defining a pressure chamber and two substantially parallel bores which open into said pressure chamber;

an operating element mounted on said housing for movement between a rest position and a plurality of braking positions and extending into said pressure chamber;

a booster piston received in one of said bores for axial displacement therein;

a brake control valve member received in the other of said bores for axial movement therein between a first and a second position in which it establishes communication of said pressure chamber with the reservior and with the auxiliary source, respectively;

a multipart lever actuation mechanism for moving said valve member in dependence on the position of said operating element, including

at least one support lever having two spaced ends, and

at least one control lever having a mounting portion pivot-

ally mounted on said said support lever between said ends thereof, and first and second end portions extending from said mounting portion; and

means for so mounting said actuation mechanism on said housing that one of said ends of said support lever engages said operating element and said first and second end portions of said control lever respectively engage said booster piston and said valve member, including

means for bounding a through opening in said housing leading into said pressure chamber and having such dimensions as to permit insertion of said actuation mechanism therethrough,

a retaining member sealingly and stationarily mounted in said opening of said housing at the conclusion of the inserting operation, and

means for pivotally supporting the other of said ends of said support lever on said retaining member.

4,462,301

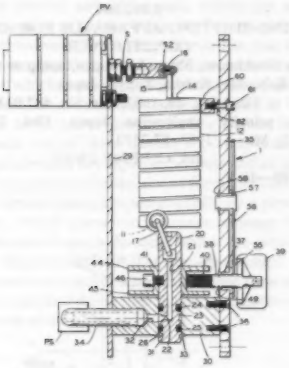
BOURDON TUBE ACTUATOR

Kip B. Goans, Harvey, La., assignor to Baker CAC, Inc., Belle Chasse, La.

Filed Nov. 4, 1981, Ser. No. 318,165

Int. Cl.³ F01B *19/04;* G01L *7/04;* F16K *17/36*

U.S. Cl. 92—48 **5 Claims**



1. A Bourdon tube actuator comprising, in combination: a generally cylindrical support post; stationary means for journalling said support post for rotational movement about the longitudinal axis of the support post; a Bourdon tube having an open and a closed end interconnected by helical turns; said support post having a fluid conduit therein; a support pipe connecting said open end of said Bourdon tube to said fluid conduit, thereby supporting said Bourdon tube on said support post, means for connecting said fluid conduit to a fluid pressure source to be monitored, whereby an increase or decrease in pressure of said fluid pressure source causes said Bourdon tube to respectively circumferentially expand or contract; a linearly shiftable valve actuator; means for operatively connecting said closed end of said Bourdon tube to said actuator, whereby circumferential expansion or contraction of said Bourdon tube effects a linear shifting of said actuator; and manually operable means for adjusting the angular position of said support post about its said longitudinal axis to calibrate the response movement of said valve actuator relative to the change in fluid pressure of said fluid pressure source, said means for adjusting the angular position of said support post comprising a collar co-rotatively secured to said support post, said collar having axially spaced flanges respectively defining aligned slots in their periphery, a pin mounted in said slots, said pin having a threaded opening traversing the pin axis intermediate said slots, and an axially fixed, manually rotatable, threaded element cooperating with said threaded opening.

3. An apparatus for monitoring a fluid pressure and effecting the linear movement of an actuator in response to the departure of a fluid pressure above or below a predetermined range comprising, in combination: a first Bourdon tube having an open and a closed end and helical turns intermediate said open and closed ends; a generally cylindrical first support post; a first stationary means for journalling said first support post; said first support post having a first fluid conduit therein; a first support pipe connecting said open end of said first Bourdon tube to said first fluid conduit, thereby supporting said first Bourdon tube on said first support post; means for connecting said first fluid conduit to the fluid pressure source to be monitored, whereby an increase or decrease in pressure of said fluid pressure source causes said first Bourdon tube to respectively circumferentially expand or contract; a second Bourdon tube having an open and a closed end and helical turns intermediate said open and closed ends; a generally cylindrical second support post; stationary second means for journalling said second support post for rotational movement about the longitudinal axis of the second support post and positioning said second support post in parallel relationship to said first support post; said second support post having a second fluid conduit therein; a second support pipe connecting said open end of said second Bourdon tube to said second fluid conduit, thereby supporting said second Bourdon tube on said second support post; means for connecting said second fluid conduit to the fluid pressure source to be monitored, whereby an increase or decrease in pressure of said fluid pressure source causes said second Bourdon tube to respectively circumferentially expand or contract; a linearly shiftable actuator; means for operatively connecting said closed ends to said first and second Bourdon tubes to said actuator, whereby an increase in pressure of the fluid pressure source effects a linear shifting of said actuator in one direction by circumferential expansion of one of said Bourdon tubes and a decrease in pressure of said fluid pressure source causes a linear shifting of said actuator in the same direction by circumferential contraction of the other of said Bourdon tubes; a first manually operable means for adjusting the angular position of said first support post about its longitudinal axis to calibrate the response movement of the actuator relative to an increase in fluid pressure of said fluid pressure source; and a second manually operable means for adjusting the angular position of said second support post about its said longitudinal axis to calibrate the response movement of said actuator relative to a decrease in fluid pressure of said fluid pressure source.

4,462,302

MOTOR FUEL FEED PUMP

Siegfried Hertell, Radevormwald, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik Ag, Remscheid-Lennep, Fed. Rep. of Germany

Filed Sep. 23, 1981, Ser. No. 305,035

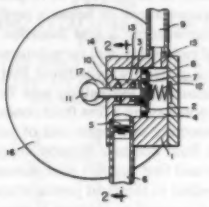
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1980, 8025955[U]; Nov. 12, 1980, 8030185[U]

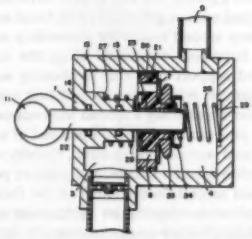
Int. Cl.³ F04B *21/04;* F16J *15/447, 1/10*

U.S. Cl. 92—248 **9 Claims**

1. A motor fuel feed pump with a cylinder chamber divided into a pressure side and a suction side by a piston or membrane and operated by a tappet drive wherein the tappet is linearly guided and sealed in a housing segment which projects into the cylinder chamber of the pump on its suction side or on its pressure side in such a way that the motor fuel flows around the projecting housing segment, said tappet consisting of steel and said piston consisting of a plastic material which is stable in

form and has a low coefficient of thermal expansion sufficient to meet the operating characteristics of the pump, the piston





being slidably mounted with respect to the tappet by means of an inner metal bushing.

4,462,303

MULTIFUNCTION SAIL MIRROR

Harold C. Gebhard, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/00758, 371 Date Jun. 1, 1982, 102(e) Date Jun. 1, 1982, PCT Pub. No. WO83/04225, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 1, 1982, Ser. No. 403,750

Int. Cl.³ B60H *1/00*; B60R *1/06*

U.S. Cl. 98—2 **4 Claims**

1. In an automotive vehicle body having a windowed side door for enclosing a passenger compartment including a generally triangular sail area at the leading edge of the window bounded on its rear edge by a substantially vertical division bar, an improved sail mirror assembly of the type having a generally hollow housing carrying a mirror and fixed to the side door in registration with the sail area and including means for passing air heated by the vehicle heating system from the passenger compartment to the mirror, characterized in that:

A. flexible conduit means are provided having one end connected to the vehicle heating system and the other, open end positioned within the side door adjacent the sail area;

B. means defining a flow path through the hollow housing around the mirror are provided;

C. a plurality of slots are formed through portions of the vehicle door proximate the division bar adjacent the inner surface of the side window;

D. first and second aligned apertures are formed through the mirror housing and the vehicle door, respectively;

E. a first door member is pivotally mounted adjacent the first aperture and includes a portion engageable with the division bar slots and is selectively movable between a first position wherein the first aperture is closed and the division bar slots and the conduit open end are in fluid communication and a second position wherein the first aperture is open and the division bar slots are closed; and

F. a second door member is pivotally mounted adjacent the second aperture and is selectively movable by first control means in unison with the first door member between a first position, coinciding with said first door first portion wherein the second aperture is closed and a second position wherein said second aperture is open.

4,462,304

WIND-SHIFTING APPARATUS FOR AN AIR CONDITIONER

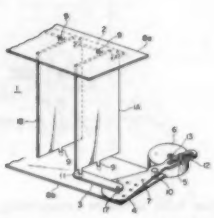
Yasuhiko Hashimoto, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,033

Claims priority, application Japan, Oct. 2, 1981, 56-146783[U]; May 6, 1982, 57-75733

Int. Cl.³ F24F *13/10*

U.S. Cl. 98—40 V **12 Claims**



1. A wind-shifting apparatus for an air conditioner, comprising:

a plurality of wind-shifting plates;

means for pivotally supporting said wind-shifting plates in front of a main body of said air conditioner;

a drive source having a rotary shaft which provides rotary motion;

a movable plate connected to said rotary shaft;

a support for pivotably securing said movable plate at a point between opposite ends thereof, said movable plate having converting means at one end thereof connected to said rotary shaft for converting said rotary motion of said rotary shaft into pivotable motion of said movable plate about said support, an opposite end of said movable plate having a plurality of holes therein;

an arm having a shaft engaged with one of said plurality of holes in said opposite end of said movable plate; and

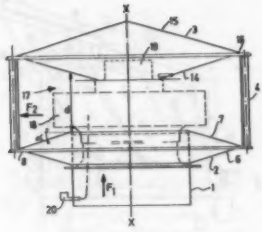
means for connecting said arm to one of said plurality of wind-shifting plates so that said rotational motion of said drive shaft pivotably rotates said one of said plurality of wind-shifting plates to change a direction of wind being blow from said air conditioner main body.

4,462,305

STATIC, DYNAMIC AND MECHANICAL ASPIRATOR FOR A GASEOUS FLUID

André Amphoux, 12, rue Jules César, Paris 12, France 75012

Filed Oct. 12, 1982, Ser. No. 433,822
Claims priority, application France, Oct. 13, 1981, 81 19229
Int. Cl.³ F23L 17/02
U.S. Cl. 98—78 7 Claims



1. Aspirator device for a gaseous fluid, in particular for ejected gases or fumes, comprising mechanical primary means for fluid extraction, static secondary fluid extraction means, and means for control and adjustment, which can make the primary means active or passive when the flow of gaseous fluid reaches a predetermined level, characterized in that the static secondary means are constituted by a lower element and an upper element which are superposed and coaxial, and rigidly fixed to one another, a certain distance apart, by at least one crossbrace, the lower lower element having a lower base and a lower cap, each one of them having a pseudo-frustoconical form, the upper element having an upper base and an upper cap each one having a pseudo-frustoconical form, the base and cap of the lower element being crossed coaxially by a pipe integral with the latter, which opens into the space between the lower and upper elements through an outlet orifice for gaseous fluid, and further characterized in that the mechanical primary means of extraction are active when the desired flow of ejected fluid is below a minimal desired level, and are passive when the flow reaches the minimal level.

4,462,306

ADJUSTABLE COOKING GRILL

Charles R. Eisendrath, 1211 Ferdon Rd., Ann Arbor, Mich. 48104

Filed Mar. 30, 1982, Ser. No. 363,604
Int. Cl.³ A47J 37/04
U.S. Cl. 99—340 5 Claims

1. In a grill assembly having a framework support and a vertically movable food grill to be positioned at various levels in a cooking area above a fire grate and having a front side and a rear side, that improvement which comprises:

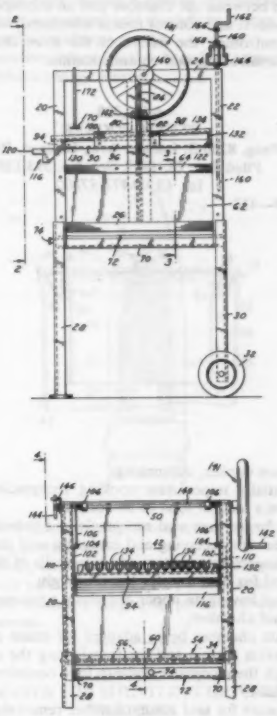
(a) a horizontal support frame movable to various vertical positions relative to a fire grate by remote manually operable means including hoist cables secured at each end to said frame,

(b) slot guide means on said framework support located between said front and rear sides,

(c) means on said support frame slidably engageable with said slot means to guide said support frame for vertical movement relative to said framework support, and

(d) a food support grill removably supported on said horizontal support frame independent of said slot guide means,

(e) the means on said support frame comprising a bracket on each side of said support frame which includes a vertical guide for said frame cooperable with said slot guide means, an anchor point for a hoist cable on each said bracket, a rotisserie support on said bracket fore and aft of said vertical guide, and rotisserie rods mountable at each



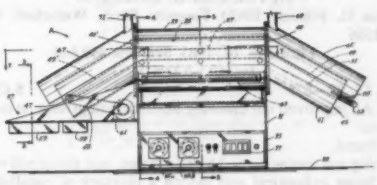
end in said brackets for utilization when said food support grill is removed from said horizontal support frame.

4,462,307

HUMPBACK OVEN-BROILER

Harold D. Wells, St. Louis, Mo., assignor to Pet Incorporated, St. Louis, Mo.

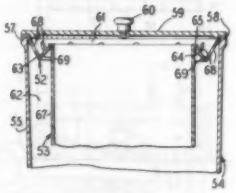
Filed May 23, 1983, Ser. No. 496,912
Int. Cl.³ A47J 37/04
U.S. Cl. 99—386 23 Claims



1. An oven-broiler of the humpback type including a tunnel-form cooking chamber and a conveyor therein for conveying food products through the chamber for cooking of such products by infrared radiation, the oven-broiler having structure defining an entrance and an exit at opposite ends of the chamber for ingress and egress, respectively, of food products relative to the chamber, the entrance and exit being each located at a level lower than the chamber for causing the chamber to

entrap a heated, oxygen-starved atmosphere and characterized by the oven structure including means for defining an elongate aperture along the bottom of the chamber for providing communication between the chamber and an atmosphere external to the chamber, and control means associated with said aperture for controlling the nature of the oven chamber atmosphere by controlling said communication.

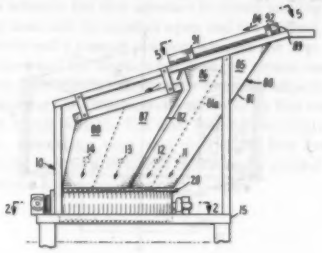
4,462,308
STEAM COOKER
Gung H. Wang, 8200 S. Indiana Ave., Chicago, Ill. 60619
Filed Jun. 28, 1982, Ser. No. 393,125
Int. Cl.³ A47J *37/00*
U.S. Cl. 99—413 **20 Claims**



1. A steam cooker, comprising:
an essentially imperforate cooking receptacle adapted to receive a load of food to be cooked;
a vessel larger than said receptacle and providing a steam chamber for receiving and enclosing said receptacle and with imperforate bottom and side walls of the receptacle adapted for heat transfer therethrough;
said vessel having an upper end about a top access opening into said chamber;
said steam chamber being adapted for steam cooking heat generation therein and for transferring the cooking heat through the receptacle walls to food contained within the receptacle;
a top closure for said steam chamber removably supported upon said upper end of the vessel;
and a generally frusto-conical supporting ring extending obliquely downwardly and inwardly from said upper end and having a lower end with upwardly directed shoulder means at an elevation substantially below said upper end and removably engaging downwardly facing shoulder means on said receptacle;
said supporting ring having means for directing steam from said chamber into cooking relation onto food in said receptacle.

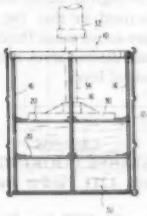
4,462,309
NUTCRACKING MACHINE
James G. Frazier, 10830 Yosemite Blvd., Waterford, Calif. 95386
Filed Jan. 24, 1983, Ser. No. 460,645
Int. Cl.³ A23N *5/00*
U.S. Cl. 99—575 **5 Claims**

1. An improved nut cracking machine comprising, in combination:
a frame,
sizing roll means carried by said frame, said sizing roll means being cylindrical and having a plurality of parallel, circumferential arcuate grooves, the width and depth of said arcuate grooves varying in a predetermined fashion in multiple sets along the length of the roll,
sizing roll drive means carried by said frame for driving said sizing roll at a selectable, predetermined speed,
cylindrical cracking roll means carried by said frame, and mounted for rotation such that nuts are cracked by passing between said sizing roll means and said cracking roll means, but are not crushed, and whereby virtually all nuts regardless of size are subjected to approximately the same cracking force,
spring mounting means for adjustably and resiliently urging said sizing roll and said cracking roll together, whereby foreign objects such as rocks will cause the sizing and cracking rolls to separate momentarily to allow passage therebetween of the foreign object without damaging



either roll, and whereby the lateral pressure exerted by said rolls on nuts passing therebetween may be adjusted, and
feeding means for separating larger nuts from smaller nuts and directing various sized nuts to appropriate sized arcuate grooves of said sizing roll whereby nuts of various sizes may be simultaneously cracked.

4,462,310
COMPACTING DEVICE
O. L. Jackson, P.O. Box 1627, and Noah F. Graham, 16424 Powell Rd., both of Brooksville, Fla. 33512
Filed Dec. 21, 1982, Ser. No. 451,913
Int. Cl.³ B30B *15/00*
U.S. Cl. 100—219 **6 Claims**

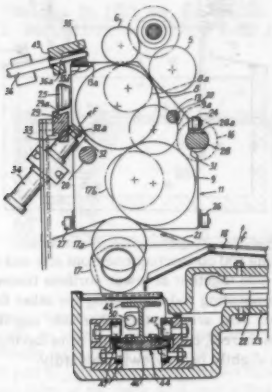


1. A compacting device of the type adapted to be closely fitted within a container for compacting material within the container and maintaining the material in compacted condition comprising a base member having a peripheral configuration complementary to the cross-sectional dimensions of the container and adapted to be placed at the bottom of the container, a plurality of threaded rods disposed perpendicular to said base member and secured at one end to said base member adjacent the periphery thereof in substantially equally spaced relation, a retaining member having a peripheral configuration substantially identical to the peripheral configuration of the base member extending about said rods and secured to the opposite ends of said rods, at least one compacting plate having a peripheral configuration similar to the peripheral configuration of said base member and adapted to fit within said rods perpendicular thereto, and locking means secured to said compacting plate and disposed in engagement with said threaded rods to permit movement of said compacting plate towards said base member while preventing movement of said compacting plate in the opposite direction.

4,462,311
OFFSET PRINTING MACHINE WITH VARIABLE FORMAT

Georges E. Armelin, Orleans, France, assignor to Machines Chambon, Orleans, France

Filed May 24, 1983, Ser. No. 497,520
Claims priority, application France, May 25, 1982, 82 09006
Int. Cl.³ B41F 7/04, 13/20
U.S. Cl. 101—143 9 Claims



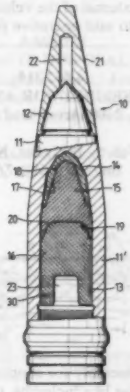
1. An offset printing machine with variable format comprising at least one inking roller receiving a layer of ink from an inking device and a layer of dampening solution from a dampening device, a plate cylinder tangential to the inking roller, a blanket cylinder tangential to the plate cylinder and an impression cylinder mounted on a mobile support so as to be applied under pressure against the blanket cylinder, the web to be printed passing between this blanket and the impression cylinder, the plate cylinder and the blanket cylinder being mounted to rotate between two vertical and longitudinal side elements connected together by cross pieces and forming therewith a cassette which is mobile transversely, i.e. perpendicularly to the direction of advance of the printed web, two upper transverse rails extending between two front and rear longitudinal uprights of the frame of the machine and from which the cassette is suspended, during a movement of introduction or removal of said cassette, via upper rollers of horizontal and longitudinal axes mounted in the upper part of the cassette, these two upper transverse rails projecting forwardly with respect to the front upright of the frame, this front upright bearing, on its outer face, two lower horizontal arms extending forwardly and on which the cassette rolls, during a movement of introduction or removal, via lower rollers of horizontal and longitudinal axes, mounted in the lower part of the cassette.

4,462,312
SHATTERING AND INCENDIARY SHELL CONTAINING A PROJECTILE BODY

Paul Cahannes, Embrach; Eduard Daume, Richterswil, and Jürg Sarbach, Jona, all of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jun. 2, 1982, Ser. No. 384,180
Claims priority, application Switzerland, Jun. 24, 1982, 4184/82
Int. Cl.³ F42B 13/14
U.S. Cl. 102—364 4 Claims

1. A shattering and incendiary shell comprising:
a projectile body;
a ballistic hood arranged forwardly of said projectile body and coacting therewith;
explosive charge means arranged within said projectile body;
an incendiary charge;
said projectile body having a hollow compartment within which there is arranged said incendiary charge forwardly of said explosive charge means;
a highly-sensitive delayed-action base fuze arranged behind said explosive charge means;

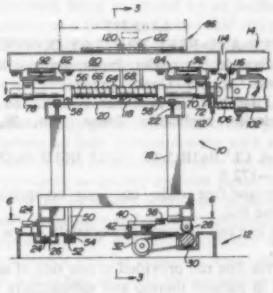


said explosive charge means having an exclusively conically-shaped tip portion; and
said incendiary charge having a rear portion containing an exclusively conically-shaped recess into which there protrudes said conically-shaped tip portion of said explosive charge means.

4,462,313
APPARATUS FOR SHUTTLING DRIVERLESS VEHICLES

Craig F. Sleep, Bangor, and Stanley K. Gutekunst, Nazareth, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 7, 1981, Ser. No. 328,280
Int. Cl.³ B61J 1/10
U.S. Cl. 104—50 9 Claims



1. A driverless shuttle vehicle for use in an automated system comprising a body having wheels adapted for movement along rails therebelow, a track supported by said body, said track having rails for contact with wheels of a driverless vehicle adapted to be supported thereby, one of said rails being a drive shaft supported for rotation about its longitudinal axis and being horizontally disposed, means coupling said track to said

body so that said track can reciprocate horizontally a short distance relative to the body from an inoperative position to an operative position, in its operative position said track being arranged for loading or unloading of a driverless vehicle, and said track including a traffic control device having a cam surface for contact with a cam follower on a driverless vehicle adapted to be supported thereby, said track being arranged on said body so as to be non-rotatable with respect to the body, said track having means on one end portion thereof for engagement with a motor external of the vehicle and which is adapted to move said track to said operative position.

4,462,314

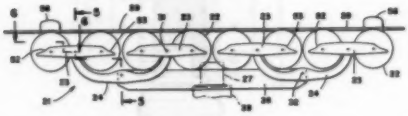
ROCKER ARM ASSEMBLY FOR AN AERIAL TRAMWAY

Jan K. Kunczynski, 2400 Arrowhead Dr., Carson City, Nev. 89701

Filed Feb. 5, 1982, Ser. No. 346,167

Int. Cl.³ B61B 7/00

U.S. Cl. 104—115 **13 Claims**



1. A rocker arm assembly for support, of a haul rope for an aerial tramway or the like including rocker arm means, rope supporting sheave means rotatably mounted to said rocker arm means, and rocker arm mounting means formed for pivotal cantilevered mounting of said rocker arm means outwardly from a support structure, wherein the improvement in said assembly is comprised of:

said rocker arm means including a sheave carrying rocker arm formed and positioned to extend along only an outward side of said sheave means;

said sheave means being cantilevered inwardly toward said support structure from said sheave carrying rocker arm to position said sheave means for support of said rope inwardly of said sheave carrying rocker arm, and

said sheave carrying rocker arm being integrally formed with rope catching means outwardly of said sheave means and being formed for passage of hanger arm means attached to said rope and supported on said rope catching means over the outwardly facing side of said rocker arm means.

4,462,315

POWER-AND-FREE TROLLEY CONVEYOR

Takao Wakabayashi, Toyonaka, Japan, assignor to Nakanishi Metal Works Co., Ltd., Osaka, Japan

Filed Nov. 17, 1981, Ser. No. 322,188

Claims priority, application Japan, Nov. 28, 1980, 55-172007[U]

Int. Cl.³ B61B 5/02, 10/02; B61D 49/00

U.S. Cl. 104—172 S **2 Claims**

1. A power-and-free trolley conveyor comprising:

a power line rail,

a first free line rail disposed immediately below said power line rail,

a second free line rail provided at one side of said first free line rail in parallel thereto and substantially in the same lateral plane,

a first front trolley and a first rear free trolley each suspended form the first free line rail,

a second front free trolley and a second rear free trolley each suspended from the second free line rail, and

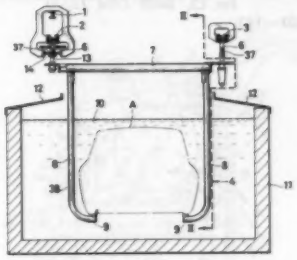
a hanger suspended from the four free trolleys,

the hanger comprisng

an integrally formed rectangular horizontal frame having one side suspended from the first front and rear free trolleys and the opposite side suspended from the second front and rear free trolleys,

two front arms downwardly fixed to the front opposite sides of the horizontal frame, respectively,

two rear arms downwardly fixed to the rear opposite sides of the horizontal frame, respectively,



a connecting rod connecting one front arm and one rear arm on one side together at lower portions thereof, and

another connecting rod connecting the other front arm and the other rear arm on the other side together at lower portions thereof, each of the four arms having a lower end portion slightly bent sidewise inwardly.

4,462,316

LOAD TRANSFER OR TRAVERSING DEVICE

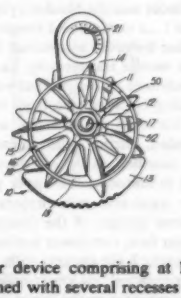
Alan W. Tupper, The Weavers House, Castle Combe, Wiltshire, SN14 7HX, England

Filed Mar. 23, 1982, Ser. No. 360,986

Claims priority, application United Kingdom, Apr. 16, 1981, 8112221

Int. Cl.³ B61B 7/00

U.S. Cl. 105—151 **15 Claims**



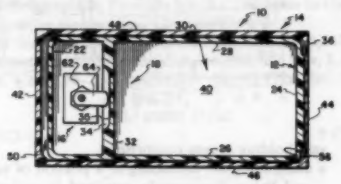
6. A load-transfer device comprising at least one rotary wheel which is formed with several recesses in its periphery, the recesses being evenly spaced around the wheel with adjacent recesses being separated by a projecting part of the wheel; a guide member supported on the wheel, said guide member and said wheel having cooperating relatively rotatable surfaces and the arrangement being such that, when the device and a load bearing element, which extends transversely to the plane of said one wheel and cooperates in use with the device, encounter one another, said one wheel can rotate about its axis relative to the guide member with said element being received, guided and passed in one or a succession of the aforesaid recesses with said element, or an elongate member supported thereby, being located with respect to the wheel by the guide member; a connection element for attachment of a load or a load support to the device, the connection element being pivotally mounted on said wheel about the axis thereof; and annular members located in arcuate grooves in end surfaces of the projecting parts of the wheels to resist disengagement from the

device of an elongate member which cooperates in use with the device.

4,462,317
LOCK BOXES

Lloyd Franko, 9580 Crackel Rd., Aurora, Ohio 44202, and Lenard Lapchynski, 8219 S. Bedford Rd., Macedonia, Ohio 44056

Filed Sep. 29, 1982, Ser. No. 426,286
Int. Cl.³ B65D 55/14; A47G 29/00; E05C 19/00
U.S. Cl. 109—45 **8 Claims**



1. A lock box, comprising:

(a) a generally rectangular, box-like base structure having:

(i) a generally rectangular back wall;

(ii) a first pair of side walls which project forwardly from opposed sides of the back wall, and a first pair of end walls which project forwardly from opposed ends of the back wall, the first side walls and the first end walls cooperating to define a forwardly-opening cavity;

(iii) a bar extending through the cavity interconnecting the first side walls;

(iv) a receiving formation provided in the bar;

(b) a generally rectangular, box-like cover structure having:

(i) a generally rectangular front wall;

(ii) a second pair of side walls which project rearwardly from opposed sides of the front wall, and a second pair of end walls which project rearwardly from opposed ends of the front wall, the second side walls and the second end walls cooperating to define a rearwardly-opening cavity;

(c) lock assembly means carried by the cover structure and having a bolt which is movable selectively into and out of engagement with the receiving formation when the cover structure is in a closed position with respect to the base structure;

(d) the cover structure being configured to nestingly receive the base structure within its rearwardly-opening cavity with the first and second side walls overlying each other and with the first and second end walls overlying each other, and with the front wall closing the forwardly-opening cavity defined by the base structure;

(e) the side walls of the base structure and the cover structure being configured to closely overlie each other when the base structure is received within the rearwardly-opening cavity of the cover structure to substantially eliminate relative side-to-side movement of the base structure and cover structure when these structures are nested, in contrast to the end walls of the base structure and the cover structure which are arranged to permit a limited range of relative movement between the base structure and the cover structure when these structures are nested;

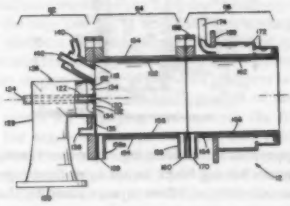
(f) interfitting formation means carried on at least one of the end walls of the base structure and at least one of the end walls of the cover structure, the interfitting formation means being movable into and out of interfitting engagement as the base and cover structures are moved relative to each other while nested; and,

(g) the lock assembly means being operable, when actuated while the base and cover structures are nested, to engage the receiving formation to releasably maintain the base and cover structures in their nested relationship, and to effect relative movement of the base and cover structures to a position wherein the interfitting formation means engage to assist the lock assembly in retaining the base and cover structures in their nested relationship.

4,462,318
WASTE DISPOSAL

Richard W. Carbeau, Hingham, Mass.; James F. Martin, Dechard, Tenn.; John H. Lanier, Manchester, Tenn., and William L. Holt, Nashville, Tenn., assignors to Ensco, Inc., Little Rock, Ark.

Filed Dec. 31, 1981, Ser. No. 336,251
Int. Cl.³ F23G 5/06
U.S. Cl. 110—238 **7 Claims**

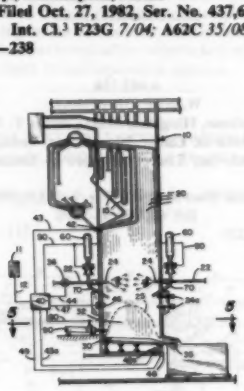


1. Apparatus for reducing liquid and slurry hazardous waste to non-hazardous by-products, said apparatus comprising: a waste/fuel blender for producing a blend of liquid fuel and waste having a predetermined minimum fuel value; a primary combustor having a horizontally disposed generally cylindrical combustion chamber; a waste/fuel nozzle for spraying said blend into said chamber, an oxygen-enriched air inlet for introducing oxygen-enriched air into said chamber, and a combustion products outlet at the end of said chamber remote from said nozzle and said air inlet for exhausting combustion products; a burner plate disposed intermediate said inlet and said outlet, said burner plate including means for axially supporting said nozzle, and a plurality of portals communicating said air inlet with said outlet and disposed radially about said nozzle, each of said portals being separated by an inclined vane for imparting rotation in a first direction to said oxygen-enriched air for turbulently mixing said air and waste/fuel and providing a turbulent swirl to the combustion products exhausting from said outlet; a horizontally disposed secondary combustor having a generally cylindrical combustion chamber of a diameter and length substantially greater than that of said primary combustor and having an inlet communicating with and disposed about the outlet of said primary combustor for receiving said combustion products; secondary air inlet means spaced about the periphery of the secondary combustor adjacent the outlet of said primary combustor and directed tangentially into said secondary combustor for directing secondary air into said secondary combustor and for imparting rotation to said secondary air in a direction opposite to the rotation of said oxygen-enriched air for reducing the turbulence of said combustion products in said secondary combustor; means for controlling the flow rate at which said waste/fuel blend and said oxygen-enriched air are introduced into said primary combustor and the rate at which said secondary air is introduced into said secondary combustor; and a quencher comprising a pipe operatively connected to the outlet of and of a diameter substantially less than that of the secondary combustor, and a plurality of spray nozzles arranged to direct a water spray into gases flowing through said pipe.

4,462,319
METHOD AND APPARATUS FOR SAFELY CONTROLLING EXPLOSIONS IN BLACK LIQUOR RECOVERY BOILERS

Theodore E. Larsen, Edina, Minn., assignor to Detector Electronics Corp., Minneapolis, Minn.

Filed Oct. 27, 1982, Ser. No. 437,671
Int. Cl.³ F23G 7/04; A62C 35/08
U.S. Cl. 110—238 **12 Claims**



1. An apparatus for preventing explosive reactions in black liquor furnaces having black liquor inlet flow pipes and spray nozzles connected to said flow pipes, caused by the addition of water to a molten smelt, comprising:

(a) means for sensing the apparent presence of water in said furnace, including radiation detection means connected to said furnace for selectively detecting the presence and absence of burning proximate said spray nozzles, and means for detecting the flow of black liquor in said flow pipes, and means connected to both said flow detecting means and said radiation detection means, for generating a warning signal when black liquor flow is detected and no radiation is detected from the proximity of said spray nozzles;

(b) means for storing an absorption agent adjacent said furnace, said means having further means for propelling said absorption agent into said smelt upon command; including at least one extensible dispensing nozzle movable from a first position outside said furnace to a second position inside said furnace; and

(c) control means coupled to said sensing means, for generating a command signal upon detection of said warning signal from said sensing means, and means for connecting said command signal to said means for propelling, to activate said propelling means to cause said dispensing nozzle to extend into said furnace and to propel said absorption agent toward said smelt.

4,462,320
WORKHOLDER FOR AN AUTOMATIC SEWING MACHINE

Hans Scholl, Oerlinghausen-Lipperreihe, Fed. Rep. of Germany, assignor to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Jul. 13, 1983, Ser. No. 513,165
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1982, 8221044[U]
Int. Cl.³ D05B 19/00, 3/12
U.S. Cl. 112—104 **6 Claims**

1. A sewing machine for producing a stitch row in a workpiece according to a predetermined contour, comprising:

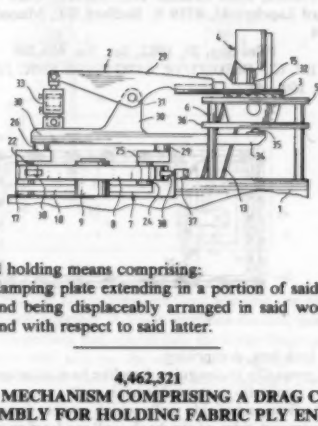
stitch forming means including a needle reciprocatingly driven on a path;

a plate supporting said workpiece in a plane extending substantially perpendicular with respect to said path; and

feeding means for generating a relative feed movement between said workpiece and said needle in accordance with said contour, said feeding means comprising:

holding means for said workpiece and

a cutout substantially profiled according to said contour and located in said holding means and representing a work area,



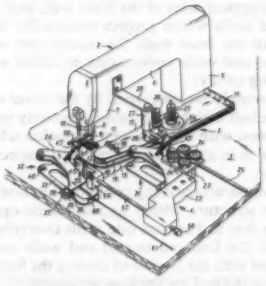
said holding means comprising:

a clamping plate extending in a portion of said cutout and being displaceably arranged in said work area and with respect to said latter.

4,462,321
SEWING MECHANISM COMPRISING A DRAG CLAMP ASSEMBLY FOR HOLDING FABRIC PLY ENDS

Günther Mall, Kaiserslautern, and Eugen Wünstel, Rodenbach, both of Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Nov. 1, 1983, Ser. No. 547,640
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240409
Int. Cl.³ D05C 9/02
U.S. Cl. 112—121.15 **5 Claims**



1. A drag clamp mechanism for holding a plurality of plies of material of a workpiece to be sewn as it is fed by a sewing machine feeding mechanism past a cooperating reciprocating needle and rotating hook located in a stitch forming area while the workpiece is engaged laterally of the stitch forming area by a contour control device which engages the workpiece, comprising a guide adapted to be connected to the sewing machine for guiding the clamped mechanism relative to the stitch forming area, a carrier movable along said guide toward and away from the stitch forming area, a first clamp having first and second pivotally interconnected clamping plates engageable with the workpiece and carried by said carrier, first locking means engageable with said first clamp to lock plates in engagement with the workpiece, first actuator means located adjacent the contour control device engageable with said first locking means when said first clamp moves thereby so as to release said locking means to disengage said plates from the workpiece, a second clamp mounted on said carrier for movement inwardly and outwardly thereof and having first and

second pivotally interconnected second clamping plates engageable with the workpiece and being relatively movable in respect to said carrier in the feed directions of the sewing machine, second locking means associated with said second clamp engageable with the first and second clamp plates to lock them in engagement with the workpiece, and second actuator means located adjacent the stitch forming area and engageable with said second locking means to release said second locking means.

4,462,322

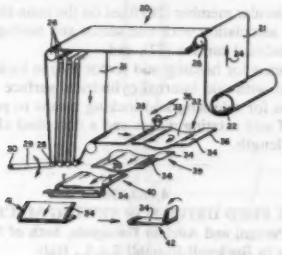
SHEET PRODUCTION SYSTEM WITH HEM EXPANDER

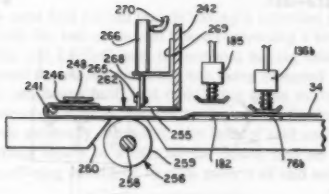
Charles E. Brocklehurst, Fountain Inn, S.C., assignor to Opelika Manufacturing Corporation, Chicago, Ill.

Division of Ser. No. 153,084, May 27, 1980, Pat. No. 4,353,316, which is a continuation-in-part of Ser. No. 956,792, Nov. 1, 1978, Pat. No. 4,269,130. This application Aug. 8, 1982, Ser. No. 406,274

Int. Cl.³ D05B *35/02*

U.S. Cl. 112—141 **9 Claims**





1. Apparatus for cutting and hemming sheet material comprising means for moving sheet material along its length from a supply toward the entrance of a cutting station, first clamp means at the entrance of the cutting station for holding the sheet material, gripping means movable between the entrance of the cutting station to the other side of the cutting station for gripping the sheet material at the entrance of the cutting station and pulling a segment of sheet material from the supply across the cutting station, a pair of parallel conveyor tapes positioned in said cutting station below the segment of sheet material and normal to the direction of movement of the sheet material into the cutting station, clamp means positioned above the segment of sheet material and movable toward and away from said parallel conveyor tapes for urging the segment of the sheet material in the cutting station against the conveyor tapes, cutting means at the entrance of said cutting station for cutting the segment of the sheet material in the cutting station away from the supply, whereby the segment of sheet material is cut from the supply, and the conveyor tapes move the cut segment of sheet material parallel to its cut edges, and further including means for folding a cut edge portion of the cut segment of the sheet material as the segment is moved parallel to its cut edges, and means for expanding the folded over portion after the edge portion has been folded over.

4. A sheet cutting and hemming system comprising means for moving elongated sheet material from a supply along its length to a cutting station, cutting means at said cutting station for cutting across the sheet material to form a cut segment of sheet material, conveyor means for moving the cut segment of sheet material through a path parallel to the cut edges of the cut segment, folding means positioned along the path of progressively folding a cut edge portion of the cut segment of sheet material into overlying relationship with the body of the cut segment, means for holding the overlying edge portion of the cut segment of sheet material from movement in a direction across the length of the cut edges of the segment, sheet moving means for positively moving the body of the cut segment of sheet material toward the fold in the cut segment of sheet material, and means for directing a flow of fluid in a direction from the sheet moving means toward the fold in the cut segment of sheet material.

9. Apparatus for forming a hem in the edge of a segment of sheet material comprising means for moving the segment along a path with the edge portion to be hemmed extending along the path, a fold platform extending along the path and spaced over the path, means for folding the edge portion upwardly from the path onto the top surface of said fold platform in overlying relationship with respect to the body portion of the segment, upper belt means for engaging and moving the folded over portion of the segment at a position on said platform to a position beyond the end of said platform, and lower belt means for engaging and moving the body portion of the segment from beneath said platform to a position beyond the end of said platform, detecting means for detecting the on-coming edge of the segment, and phase shifting means responsive to said detecting means for shifting the phase of one of said belt means to momentarily change the velocity of said one of said belt means with respect to the other of said belt means.

4,462,323

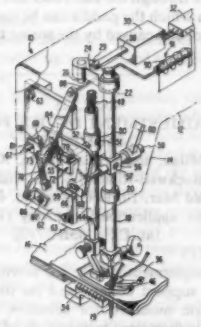
PRESSER FOOT LIFT FOR NEEDLE FEED IN A SEWING MACHINE

Robert J. Socha, Edison, N.J., assignor to The Singer Company, Stamford, Conn.

Filed May 23, 1983, Ser. No. 497,462

Int. Cl.³ D05B *29/02, 27/20, 3/02*

U.S. Cl. 112—239 **7 Claims**



1. A sewing machine comprising a frame including a work supporting bed, a needle bar supported by said frame for endwise reciprocation and lateral oscillation, a sewing needle carried on the end of said needle bar, a presser foot, means for urging said presser foot against a work material supported on said work supporting bed with an optimum pressure for said work material and sewing conditions, said means including a presser bar slidably supported by said frame and having said

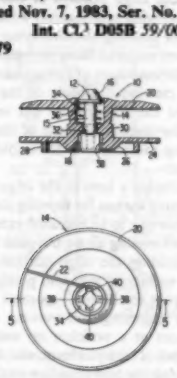
presser foot on the lower end thereof, and means for selectively elevating said presser foot out of pressure contact with said work material when said sewing needle extends through said work material.

4,462,324

BOBBIN AND PLUNGER ASSEMBLY

Robert H. Larsen, Middletown, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Nov. 7, 1983, Ser. No. 549,029
Int. Cl.³ D05B *59/00*
U.S. Cl. 112—279 **4 Claims**



1. In combination, a one-piece sewing machine bobbin and a one-piece bobbin winding plunger, the plunger including a cylindrical shaft, a control button at one end of the shaft and a flat bobbin driving paddle at the other end, the bobbin including an intermediate section with a cylindrical through opening wherein the shaft is supported, a topside button accommodating recess which communicates with said through opening and wherein a spring acts to bias the plunger upwardly in the bobbin, and a pair of crossed slots which extend upwardly from the bottom side of the bobbin, one of the slots having the paddle therein and being dead ended to provide a stop for the paddle limiting upward movement of the plunger, the other slot being formed to extend from the bottom of the bobbin to the button accommodating recess and permit the plunger to be assembled in the bobbin with an accompanying movement of the paddle down through the said other slot to a position below the bobbin from which the paddle can be turned into alignment with said one slot and caused by the spring to snap into the said one slot.

4,462,325

STITCH ADJUSTMENT DEVICE FOR SEWING MACHINES

Bruno Motta, Milan, and Erminio Nava, Arese, both of Italy, assignors to Rockwell-Rimoldi S.p.A., Italy

Filed Mar. 10, 1983, Ser. No. 474,111
Claims priority, application Italy, May 17, 1982, 21309 A/82
Int. Cl.³ D05B *27/02*
U.S. Cl. 112—315 **3 Claims**

1. A stitch adjustment device for sewing machines of the type having a support collar fixed on its main shaft and a control eccentric mounted for selective movement on the support collar, in directions transversely of the main shafts axis with a connecting rod assembled thereon for actuating the machines feed dog, said device comprising:

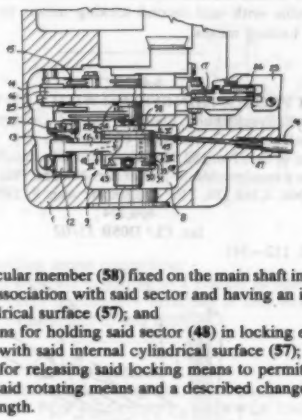
(a) a support ring (**43**) rotatably mounted on the main shaft including: (i) an adjustable eccentric (**42**) extending axially from one side thereof;

(b) means for locating said adjustable eccentric in operative association with the control eccentric;

(c) means for rotating said support ring and said adjustable eccentric to selectively position the control eccentric at a location for effecting a desired stitch length by the connecting rod;

(d) means for locking said support ring and said adjustable eccentric in their selected positions for maintaining the stitch length selected, said locking means including;

(i) a sector (**48**) fixed on one end of said support ring (**43**);



(ii) a circular member (**58**) fixed on the main shaft in operative association with said sector and having an internal cylindrical surface (**57**); and

(iii) means for holding said sector (**48**) in locking engagement with said internal cylindrical surface (**57**); and

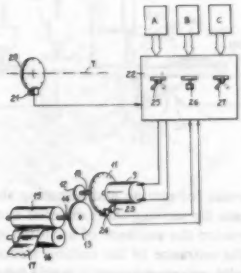
(e) means for releasing said locking means to permit actuation of said rotating means and a described change in the stitch length.

4,462,326

TAPE FEED DRIVE FOR SEWING MACHINES

Giuseppe Perego, and Adelmo Garagiola, both of Milan, Italy, assignors to Rockwell-Rimoldi S.p.A., Italy

Filed Dec. 20, 1982, Ser. No. 450,938
Claims priority, application Italy, Mar. 26, 1982, 20416 A/82
Int. Cl.³ D05B *27/10*
U.S. Cl. 112—318 **6 Claims**



1. A tape feed device for sewing machines having a rotatably driven main shaft and in which a workpiece is advanced beneath the machine's presser foot by its feed dog mechanism in timed relation to the feeding of tape thereto, said feed device comprising:

(a) means mounted on the machine for sensing its operating speed and the rate of advance of a workpiece beneath the presser foot and generating pulses representative of the operating speed and rate of advance sensed;

(b) a control unit having a microprocessor for receiving the pulses transmitted by said sensing means;

(c) tape feed rollers mounted on the machine including a drive motor operatively connected to said rollers for rotating said rollers at speeds corresponding to the number of pulses delivered by said sensing means to said control unit; and

(d) means operatively connected to said drive motor for

generating pulses representative of the speed of rotations of said rollers and transmitting these pulses back to said control unit for comparison with the pulses representing machine operating speed to effect minor changes in the speed of said drive motor.

4,462,327

MAST FOOT FOR SAIL BOARDS

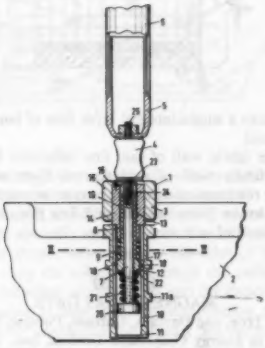
Siegfried Pertramer, Fürstenfeldbruck; Joachim Adamek, Munich, and Ernstfried Prade, Weilheim, all of Fed. Rep. of Germany, assignors to Mistral Windsurfing AG of Grindelstrasse, Bassersdorf, Switzerland

Filed Feb. 2, 1982, Ser. No. 344,951

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103586; Jan. 15, 1982, 3201143

Int. Cl.³ B63B *15/02*

U.S. Cl. 114—90 **15 Claims**



1. A mast foot for sail boards having a universal joining the mast with the hull of the sail board comprising a bearing unit, a middle pin forming part thereof and having said universal joint fixed thereto, said bearing unit being designed to be fixed to said sail board hull, said middle pin being moveable with said universal joint in relation to the rest of the bearing unit upwards generally normal to the hull of said sail board for preventing injury to a user of the board, and an adjustable spring offering resistance to such motion of said middle pin.

4,462,328

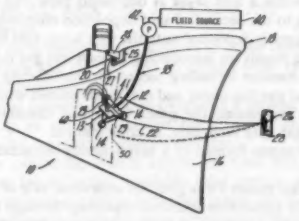
SHIP HULL CLEANING DEVICE

Stephen W. Oram, 227 N. Winter St., Adrian, Mich. 49221

Continuation-in-part of Ser. No. 222,250, Jan. 2, 1981, abandoned. This application Nov. 15, 1982, Ser. No. 441,424

Int. Cl.³ B63B *59/10*

U.S. Cl. 114—222 **14 Claims**



1. An apparatus for controlled cleaning of foulant from the hull of a water vessel comprising:

a carriage including first means for movably supporting the carriage on the hull surface;

second means for discharging a pressurized fluid against the hull surface to remove foulant from the hull including a plurality of high pressure cleaning nozzles for removing foulant from the ship's hull, mounted on said carriage, said means emitting an unconstrained fluid discharge aimed toward the hull surface;

third means for remotely displacing said carriage across the hull surface;

nozzle means for maintaining said carriage against the hull surface by discharging fluid under pressure away from said hull surface to counteract the force exerted by said high pressure cleaning nozzles that tends to separate said carriage from said hull; and

fourth means for supplying a pressurized cleaning fluid to said plurality of high pressure cleaning nozzles and said nozzle means.

4,462,329

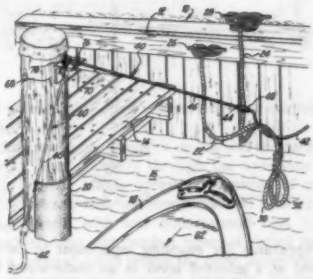
MOORING LINE HOLDING DEVICE

Donald Brushaber, 221 Hayes Ct., Normandy Beach, N.J. 08739

Filed Mar. 1, 1982, Ser. No. 353,347

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—230 **7 Claims**



1. A device for holding a mooring line in either of a first position and a second position relative to a boat dock for facilitating the mooring of a boat at the dock, said device comprising:

a mounting member;

mounting means on the mounting member for mounting the mounting member upon a vertical surface associated with the boat dock;

a support upon the mounting member, said support being oriented so as to extend horizontally when the mounting member is mounted upon said vertical surface;

an elongate flexible rod extending between opposite ends in a direction parallel to the extent of the support;

swinging means mounting the elongate flexible rod adjacent one end thereof upon the mounting member for swinging movement within a plane generally parallel to the extent of the support between the first position and the second position in response to swinging forces applied to the elongate flexible rod;

mooring line holding means on the rod adjacent the other end of the rod for holding the mooring line on the rod;

stop means for defining the limits of the swinging movement of the rod such that the rod is movable along a path of movement in response to said swinging forces between the first position wherein the rod projects outwardly toward the boat when the boat approaches an inward moored location at the dock for facilitating the pick-up of the mooring line held in the mooring means, and the second position wherein the rod is swung inwardly toward the dock for facilitating the placement of the mooring line in

the mooring line holding means when the boat is in the inward moored location, in preparation for departure; and

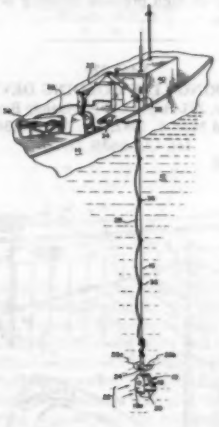
means tending to maintain the rod in a selected position along the path of movement thereof in response to discontinuing the application of said swinging forces to the rod.

4,462,330

CURRENT STABILIZED UNDERWATER PLATFORM

Leslie T. Campbell, Encinitas; Frank E. Gordon, and Herman Torkelson, both of San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 30, 1979, Ser. No. 61,975
Int. Cl.³ B63B *21/66*
U.S. Cl. 114—244 **15 Claims**



1. Apparatus for enabling equipment to be controllably operated at a selected level in an underwater environment when a current of at least negligible velocity is flowing in said environment at said level, said apparatus comprising:

a facing panel having a forward side and a rearward side;

means joined to said rearward side of said facing panel for interacting with said current to retain said forward side of said facing panel in substantially perpendicular relationship with the direction of said current, said facing panel and said current interaction means together comprising a fin assembly means; and

movable mounting means joined to said equipment and to said fin assembly means for receiving control signals, and for selectively orienting said equipment in response to said control signals.

4,462,331

INFLATABLE BOTTOM CONSTRUCTION FOR INFLATABLE BOAT

William M. McCrory, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1983, Ser. No. 462,642
Int. Cl.³ B63B *7/08*
U.S. Cl. 114—345 **2 Claims**

1. In an inflatable boat bottom structure of the type including a first inflatable floor element in superimposed relation on a second inflatable floor element, said floors each comprising upper and lower rubberized fabric walls interconnected by a multiplicity of drop-stitches as tension elements, the improvement comprising:

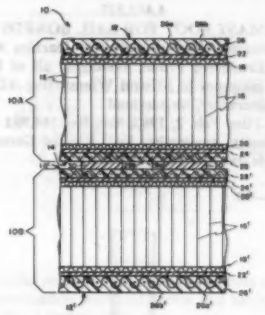
each of said walls comprising an inner scrim layer carrying said drop-stitches;

an inner synthetic rubber adhesive layer disposed on said scrim layer;

an outer layer of woven strength fabric;

an outer synthetic rubber layer in which said strength fabric is embedded;

said outer and inner synthetic rubber layers being fused and



cured into a single integral layer free of lamination interfaces; and

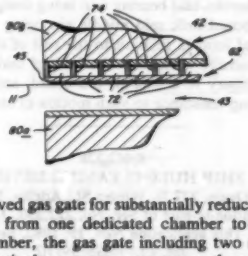
said upper fabric wall of said first inflatable floor and said lower fabric wall of said second floor each being of greater thickness and having heavier strength fabrics than do the lower fabric wall of said first floor and the upper fabric wall of said second floor.

4,462,332

MAGNETIC GAS GATE

Prem Nath, Troy, and David A. Gattuso, Pontiac, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Apr. 29, 1982, Ser. No. 372,937
Int. Cl.³ C23C *13/10*
U.S. Cl. 118—718 **13 Claims**



1. An improved gas gate for substantially reducing the backflow of gases from one dedicated chamber to an adjacent dedicated chamber, the gas gate including two spaced walls defining a relatively narrow passageway through which a substrate moves from the first of said adjacent dedicated chambers wherein a first layer is deposited onto one side of said substrate to the second of said deposition chambers wherein a second layer is deposited onto the first layer; said first chamber including means for introducing at least one gas thereinto; said second chamber including means for introducing at least one additional gas thereinto; and means associated with said chambers for evacuating the gases from said chambers; said improved gas gate including, in combination:

the substrate formed of a magnetically attractable material; and

magnetic means for urging the unlayered side of the magnetically attractable substrate traveling through the passageway into sliding contact with one of said passageway walls, whereby the distance between said passageway walls may be decreased without bringing the layered substrate surface into contact with the other of said pas-

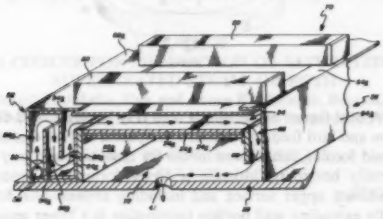
sageway walls so as to reduce the backflow of gases from the second chamber through the gas gate passageway.

4,462,333

PROCESS GAS INTRODUCTION, CONFINEMENT AND EVACUATION SYSTEM FOR GLOW DISCHARGE DEPOSITION APPARATUS

Prem Nath, Rochester; Kevin R. Hoffman, Sterling Heights, and Timothy D. Laarman, Almont, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 27, 1982, Ser. No. 437,075
Int. Cl.³ C23C *13/10*
U.S. Cl. 118—723 **5 Claims**



1. In an isolated glow discharge deposition chamber adapted for the deposition of semiconductor layers onto a relatively large area substrate, the chamber including: at least one cathode; a substrate spacedly removed from the cathode; a cathode region defined above, below and to the sides of the cathode; means for moving the substrate through the cathode region; means for introducing process gases into the deposition chamber; shield means at least partially surrounding the cathode region; means for energizing the at least one cathode to disassociate the process gases into plasma; and means for withdrawing unused process gases and nondeposited plasma from the cathode region to evacuation means; the improvement comprising, in combination:

said shield means including opposed flanges, the distance between said flanges being greater than the width of the substrate so that the substrate may be urged against the flanges, said shield means adapted to cooperate with the substrate to establish a direct path of travel for the process gases from the introducing means, through the cathode region and to the evacuation means; whereby the substrate travels through the cathode region of the deposition chamber beneath said flanges of said shield means so that the entire transverse width of the substrate is exposed for the deposition of semiconductor material thereunto.

4,462,334

SOLAR ANIMAL STRUCTURE

Ho K. Kim, 2107 Somerset Dr., Wilson, N.C. 27893

Filed Aug. 19, 1982, Ser. No. 409,540
Int. Cl.³ A01K *1/00, 31/20*; A24J *3/02*
U.S. Cl. 119—16 **10 Claims**

1. A solar farm animal house adapted to house farm animals such as broilers and the like and to collect solar energy for heating said house, comprising:

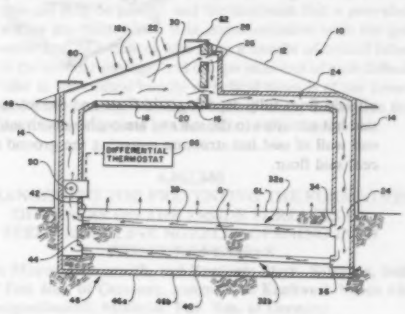
A. an animal housing structure overlying a ground area and including an exposed earthen floor having an earthen surface for supporting animals thereon;

B. a solar collecting system associated with said housing structure for collecting available solar energy, said solar energy collecting system including means for directing a fluid medium through the same where solar energy in the form of heat may be readily transferred to said fluid medium;

C. underground heat transfer means for heating said farm animal housing structure via and through the earth underlying said farm animal housing structure;

D. connecting means operatively interconnected between said solar energy collecting system and said underground heat transfer means for transferring collected solar energy in the form of heat from said solar energy collecting system to said underground heat transfer means;

E. said underground heat transfer means being buried and disposed at a selected depth within the earth underlying said farm animal housing structure and including means for transferring heat upwardly from the underground heat transfer means through the overlying earth and upwardly through said exposed earthen floor such that heat is emitted from the surface of the earthen floor and provides heat



for farm animals supported and moving over said earthen floor; and

F. said underground heat transfer means and the means for transferring heat upwardly through the overlying earth including conduit means operatively connected to said connecting means that interconnects said solar energy collecting system with said underground heat transfer means and wherein said conduit means is buried and disposed at a selected depth within the earth underlying said housing structure and extends generally horizontally through the ground wherein said conduit means is generally uniformly spaced through the earth underlying said housing structure for emitting heat generally uniformly through the surface of said exposed earthen floor.

4,462,335

SWINE FARROWING HUT AND METHOD OF FARROWING PIGS AND MAINTAINING A DISEASE-FREE FARROWING HUT

Claude W. Ahrens, Grinnell, Iowa, assignor to Ahrens Agricultural Industries Co., Grinnell, Iowa

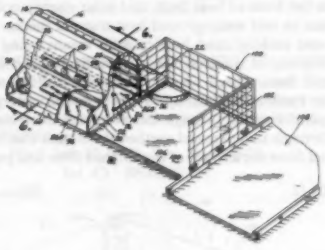
Continuation of Ser. No. 267,089, May 26, 1981, Pat. No. 4,393,812, which is a continuation of Ser. No. 945,084, Sep. 25, 1978, Pat. No. 4,269,144. This application Sep. 20, 1982, Ser. No. 420,358
The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—16 **2 Claims**

1. A swine farrowing hut comprising,

a hut structure including a floor and an enclosure of nonporous material which bacteria cannot penetrate and having a center sow section and oppositely disposed side pig sections and opposite end walls,

said floor including oppositely disposed floor portions under each of said oppositely disposed side pig sections and said floor portions containing heating means for heating said side pig sections whereby pigs will be attracted to the side sections from the center section where the sow cannot lie on the pigs and injure them, and

pivot means connecting said floor to one of said end walls for pivoting said hut structure from a lowered position extending over said floor to a raised open ended position



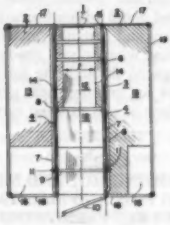
off said floor fully exposing said floor and the interior of said hut structure to the sun and atmosphere with said one end wall of said hut structure engaging the ground adjacent said floor.

4,462,336

FARROWING PEN FOR DOMESTIC ANIMALS

Ryusi Kawakami, and Tadahiro Masumura, both of Tochigi, Japan, assignors to C. Itoh Feed Mills Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 390,112
Claims priority, application Japan, Jun. 25, 1981, 56/97476
Int. Cl.³ A01K *1/02*
U.S. Cl. 119—20 **2 Claims**



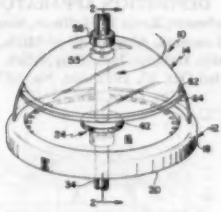
1. In a farrowing pen for a swine comprising a mother pen having a front portion to accommodate the head and shoulder portion of the swine and a rear portion to accommodate the rump portion of the swine and newborn pens provided at both sides of the mother pen, separated by fences and the floor of the mother pen which is at a level above the level of the floor of the newborn pens and which is separated by a shoulder from the floor of each newborn pen, the improvement which comprises: the width of the floor of the mother pen being about the minimum width to allow the mother swine to lie thereon, the width of the front portion of the floor of the mother pen being narrower than the width of the rear portion of the floor in accordance with the distance between forelegs being smaller than the distance between the hind legs and the distance between the fences being just large enough to allow the mother swine to stand up and lie down, and said floor of the newborn pens is a slatted floor wherein the slats lie at an angle to the mother pen.

4,462,337

BIRD FEEDER WITH ROTATABLE COVER

Peter Kilham, Mill Rd., Foster, R.I. 02825

Filed Feb. 22, 1983, Ser. No. 468,175
Int. Cl.³ A01K *39/00*
U.S. Cl. 119—51 R **14 Claims**



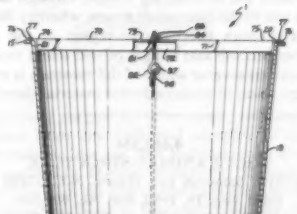
1. A bird feeder comprising a seed tray having a seed distribution and bird feeding surface, a peripheral surface surrounding said feeding surface and means for mounting said tray in a generally horizontal attitude, a cover forming a generally imperforate upper surface and including at least one downwardly extending wall portion terminating in a lower terminal edge, said cover position above said seed tray with said terminal edge thereof superposed and in proximal or contacting relationship such that access to birds, wind and the like between such opposed surfaces is essentially prevented with respect to said seed tray peripheral surface, said cover including a bird access opening formed in said cover at one side thereof, said cover supported for free rotational movement with respect to said tray such that said access opening is positionable on the downwind side of said feeder when in use position.

4,462,338

ROTARY LIVESTOCK FEEDER

Ronald M. Thibault, Osborne, Kans., assignor to Osborne Industries, Inc., Osborne, Kans.

Continuation-in-part of Ser. No. 169,797, Jul. 17, 1980, Pat. No. 4,353,329. This application Jan. 18, 1982, Ser. No. 339,862
Int. Cl.³ A01K *5/00 2*
U.S. Cl. 119—53.5 **17 Claims**



1. A feeder for dispensing feed to livestock, which comprises:

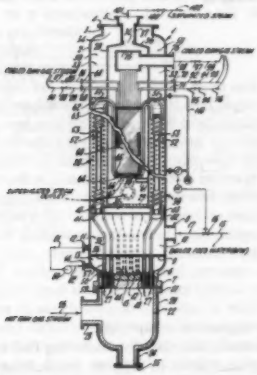
(a) a hopper including a bottom having a feed discharge aperture therethrough; and a side wall;
(b) a deflector mounted in said hopper in vertically spaced covering relationship over said aperture and having a lower edge extending outwardly of said hopper bottom aperture and inwardly of said side wall;
(c) sweep means mounted for rotation between said deflector and said hopper bottom for sweeping feed to said aperture to discharge therethrough; and
(d) means operably associated with the deflector for adjusting the vertical spacing thereof over said hopper bottom, the egress of feed from the hopper being limited to flow through the aperture, whereby the rate of flow in response to movement of the sweep is dependent upon said vertical spacing between the deflector and the hopper bottom.

4,462,339

GAS COOLER FOR PRODUCTION OF SATURATED OR SUPERHEATED STEAM, OR BOTH

Frederick C. Jahnke, Rye, and James R. Muenger, Beacon, both of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,452
Int. Cl.³ F22D *1/00*
U.S. Cl. 122—7 R **27 Claims**



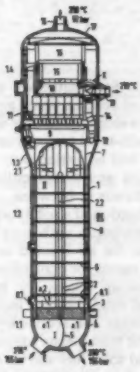
1. A gas cooler for cooling a hot raw gas stream comprising:
(1) a closed vertical cylindrically shaped pressure vessel with an upper central outlet for the passage of saturated steam;
(2) a refractory lined hot gas inlet chamber with a gas inlet, said gas inlet chamber being attached to the bottom end of said pressure vessel;
(3) a vertical coaxial cylindrically shaped elongated central chamber which is closed at the bottom and open at the top, means for supporting said central chamber above the bottom of said vessel thereby providing a water chamber between the bottoms of the pressure vessel and the central chamber, an inlet in the side wall of said water chamber for introducing water in liquid phase into the pressure vessel, said central chamber defining with said vessel along its length an annular elongated passage that communicates at the bottom with said water chamber and near the top of the vessel with a connecting passage that communicates with the top of said central chamber and said upper central outlet; said central chamber being provided near its bottom with outlet means that passes through the wall of the vessel with a gas-tight seal and through which superheated steam may be discharged;
(4) a plurality of vertical bundles of helical tubes with at least one helical tube in each bundle, said bundles of helical tubes being supported in said annular passage, each of said bundles of tubes extending lengthwise in a portion of said annular passage leaving a free annular space above said bundle of tubes for the passage of saturated steam, and wherein each of said helical tubes has a gas outlet section at the upper end and a gas inlet section at the bottom end and each gas inlet section extends through the bottom end of said vessel and into said hot gas inlet chamber; means for cooling the gas inlet section of each helical tube in each bundle of helical tubes in the annular passage; and
(5) a central bundle of helical tubes extending vertically in said central chamber, said central bundle of tubes comprising at least one concentric ring of helical tubes with at least one helical tube in each ring; wherein the downstream end of each helical tube in the central bundle is provided with a gas outlet means through which cooled raw gas may be passed, and the upstream end is provided with a gas inlet which is in communication with the gas outlet end of a helical tube from a bundle of helical tubes in the annular passage, and the gas inlet end of each helical tube in the central bundle of helical tubes is at the lower end of the central bundle of helical tubes; and means for controlling the level of the water in the vessel.

4,462,340

ARRANGEMENT FOR PREVENTING THE FORMATION OF CRACKS ON THE INSIDE SURFACES OF FEEDWATER LINE NOZZLES OPENING INTO PRESSURE VESSELS

Hans Mayer, Bubenreuth, and Zvonimir Sterk, Erlangen, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

PCT No. PCT/EP81/00103, 371 Date Mar. 12, 1982, 102(e) Date Mar. 12, 1982, PCT Pub. No. WO82/00330, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 21, 1981, Ser. No. 359,666
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027630
Int. Cl.³ F22B *1/16*
U.S. Cl. 122—34 **4 Claims**



1. Apparatus for preventing the formation of cracks in the inner surface of feedwater line nozzles which open into pressure vessels, the pressure vessels having a water/steam space and a descent space for medium formed therein, comprising a substantially horizontal line section connected to a pressure vessel for feeding feedwater into the water/steam space formed in the pressure vessel, a rising line section having a given flow travel length and being disposed downstream of said substantially horizontal line section, an overflow edge disposed at the end of said given flow travel length of said rising line section, and a downwardly-directed line section disposed at least partially between said overflow edge and the

descent space formed in the pressure vessel for admixing feedwater with the medium in the water/steam space and in the descent space for preventing temperature stratification due to flowback to warmer water in the nozzle, wherein the ratio A_n/D_i is substantially between 0.5 and 2.0, where A_n is the distance along the horizontal from the inner surface of the wall of the pressure vessel to a centerline passing through the center of gravity of the cross-sectional area defined by said overflow edge; and D_i is the inside diameter of said substantially horizontal line section connected to the pressure vessel.

4,462,341

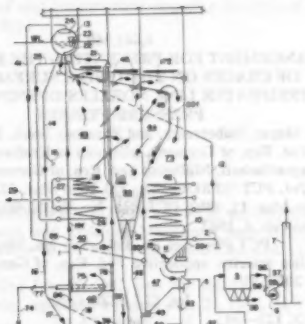
CIRCULATING FLUIDIZED BED COMBUSTION SYSTEM FOR A STEAM GENERATOR WITH PROVISION FOR STAGED FIRING

Charles Strohmeyer, Jr., 1617 Sweetbriar Rd., Gladwyne, Pa. 19035

Continuation-in-part of Ser. No. 456,586, Jan. 7, 1983, Pat. No. 4,442,796. This application Mar. 9, 1983, Ser. No. 473,651

Int. Cl.³ F22B *1/00*

U.S. Cl. 122—4 D **2 Claims**



1. An apparatus for multi-level temperature control of a circulating fluidized bed in a steam generator which comprises:

means defining a steam generator with combustion system in which the multi-level temperature control of said circulating fluidized bed is carried out;

a feedwater inlet and steam outlet and fluid cooled heat absorption circuits in between;

means for combustion of a solid fuel in a vertical fluid cooled reactor in association with inert solid particles;

first inlet means for air located in the bottom part of said reactor with means for controlling rate of air flow responsive to balancing means for partially combusting and fluidizing said solid fuel and inert particles;

second inlet means for secondary gas located at a level above said first inlet means adapted to entrain a substantial portion of said solid fuel and inert material particles in the flue gas stream produced by said means for combustion;

third inlet means for air located at a level above said second inlet means with means for controlling rate of air flow responsive to said balancing means for regulating continued combustion of particles of said solid fuel;

means for separating particles of solid materials in the flue gas downstream of said reactor;

means for recycling said separated particles as substantially inert material to said means for combustion and for association with said solid fuel;

means for delivery of cooled flue gas after separation of said particles to said second inlet means including a blower or fan with means for controlling rate of gas flow responsive to gas temperature at an intermediate location of said reactor and adapted to increase the recirculation flow to said second inlet means responsive to flue gas temperature at an intermediate location of said reactor increasing the flow to lower gas temperature to a preset point and vice versa;

said balancing means adapted to manipulate the flow of said air to individual portions of said reactor to raise flue gas temperature at said reactor outlet above flue gas temperature at an intermediate portion of said reactor, increasing air flow accelerating combustion and gas temperature rise in the respective reactor zones and vice versa.

4,462,342

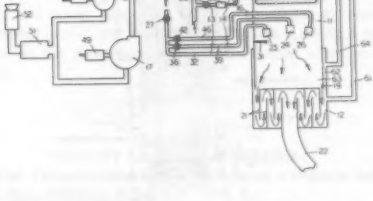
VARIABLE STAGE DIRECT FIELD BOILER

David P. Weiden, 516 E. Rocksylvania, Iowa Falls, Hardin County, Iowa 50126

Filed Feb. 8, 1982, Ser. No. 346,839

Int. Cl.³ F22B *1/18*; F02C *7/00*

U.S. Cl. 122—448 R **9 Claims**



1. A boiler apparatus comprising:

(a) a combustion chamber for receiving fuel and oxygen in sufficient quantitites to support combustion and for continuously receiving liquid water during combustion for conversion of same to steam, said combustion chamber including an output for exiting the atmospheric contents of said combustion chamber;

(b) a plurality of combustion stages, each such stage including at least one burner located within said combustion chamber;

(c) pressure sensing means operably connected to said output for sensing output pressure and to said combustion stages for controlling how many of said stages are operating at a given moment in response to output pressure;

(d) a plurality of fuel valves, at least one each for each said combustion stage, such that the delivery of fuel to said burners may be selectively controlled by said pressure sensing means.

(e) a plurality of water valves, at least one each for each said combustion stage, such that the delivery of liquid water to said combustion chamber for conversion to steam may be selectively controlled by said pressure sensing means; and

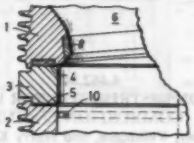
(f) liquid-to-steam converter having pneumatic pathway formed therein, an input operably connected to said combustion chamber, and an output, such that atmospheric contents from said combustion chamber may be introduced into said converter and moved through said pneumatic pathway to thereby assist in converting any remaining liquid water particles to steam.

4,462,343

CYLINDER FOR RECIPROCATING PISTON ENGINES

Rolf Eckert, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Köln, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 294,829
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1980, 3031926
Int. Cl.³ F16J 10/02
U.S. Cl. 123—41.69 3 Claims



1. A cylinder for reciprocating piston internal combustion engines with a combustion chamber subject to cold starting operation and partial load operation having hydrocarbon emissions as well as having stresses because of different thermal expansions associated therewith, said cylinder having an inner wall as well as a combustion chamber wall therewith and comprising in combination:

a cylinder head;

a cylinder tube; and

a ring arranged between said cylinder head and said cylinder tube, said ring forming a part of said inner wall of said cylinder, and said ring to prevent heat conductance being made of ceramic for heat insulating purposes to reduce heat dissipation through the cylinder wall in the region of the combustion chamber in order to increase efficiency so that during cold starting operation and partial load operation also there are reduced hydrocarbon emissions with an increase of combustion chamber wall temperature, and a gap structure including said ceramic ring located for access of cooling medium to said ceramic ring between said cylinder head and said cylinder tube to assure vertical separation of said head and tube due to said ceramic ring without any direct engagement existing between said head end tube said ceramic ring interrupting heat flow between said cylinder head and said cylinder tube along with stresses between the cylinder head and cylinder tube because of different thermal expansions being reduced as much as possible, and further including an annular disc arranged between said cylinder head and said ring, said annular disc forming slide surfaces for micro-shifting to reduce radial stresses between the cylinder head and the heat insulating ring

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4,462,344

INTAKE AND EXHAUST MANIFOLD ARRANGEMENT OF INTERNAL COMBUSTION ENGINE

Syouzabu Ura, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 21, 1982, Ser. No. 341,264
Claims priority, application Japan, Jan. 30, 1981, 56-12577
Int. Cl.³ F02M 35/00
U.S. Cl. 123—52 M 7 Claims

1. In a multiple-cylinder internal combustion engine including a cylinder head, a plurality of power cylinders arranged in series and having intake and exhaust ports located on one side of the cylinder head, an intake manifold including a plurality of branch portions leading to the intake ports and a plurality of mounting flange members securely connecting the branch portions to the cylinder head at the ends of the branch portions, an exhaust manifold including a plurality of branch portions leading from the exhaust ports and a plurality of mounting flange members securely connecting the branch portions to the cylinder head at the ends of the branch portions of the exhaust manifold, the flange members of the exhaust manifold including at least one flange member adjacent one of the flange members of the intake manifold, and a plurality of mounting bolts including at least one common mounting bolt for securing the adjacent two flange members of the intake and exhaust manifolds, said one common mounting bolt and said adjacent two flange members having predetermined clearances respectively provided between the common mounting bolt and one of the adjacent two flange members and between the

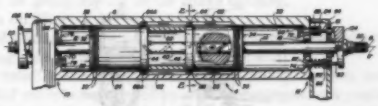
common mounting bolt and the other of the adjacent two flange members in a direction parallel with the direction in which the power cylinders of the engine are arranged in series, wherein the improvement comprises an intake and exhaust manifold arrangement in which said adjacent two flange members are spaced apart from each other in a direction parallel with said direction and have provided therebetween one region with at least one predetermined minimum clearance smaller than at least one of said respectively provided predetermined clearances.

4,462,345

ENERGY TRANSFER DEVICE UTILIZING DRIVESHAFT HAVING CONTINUOUSLY VARIABLE INCLINED TRACK

Edward E. Routery, Yuma, Ariz., assignor to Pulsar Corporation, Phoenix, Ariz.

Filed Jul. 13, 1981, Ser. No. 283,072
Int. Cl.³ F02B 75/32
U.S. Cl. 123—58 C 14 Claims



1. An engine for producing rotational motion, said engine comprising in combination:

(a) a driveshaft having a longitudinal axis;

(b) a cylinder having a longitudinal axis and having first and second ends;

(c) bearing means for rotatably supporting said driveshaft with the longitudinal axis of said driveshaft being coincident to the longitudinal axis of said cylinder and wherein each of said first and second pistons includes a hole through which said driveshaft passes;

(d) a first piston slidably mounted for axial movement within said cylinder proximate the first end thereof;

(e) a second piston slidably mounted for axial movement within said cylinder proximate the second end thereof;

(f) valve means for creating pressure differentials within the first and second ends of said cylinder in order to effect reciprocal sliding movement of said first and second pistons; and

(g) cam means coupled to said first and second pistons and coupled to said driveshaft for converting reciprocating movement of said first and second pistons into unidirectional rotational movement of said driveshaft, said cam means including a helical track and follower adapted to engage the helical track, said helical track being a continu-

ous track comprising a plurality of portions defining an axial vector parallel to the driveshaft axis and a rotational vector perpendicular to and extending circumferentially about said driveshaft axis, the ratio of the rotational vector to the axial vector for succeeding segments varying along said generally helical track for permitting said first and second pistons to exert a substantially constant torque upon the driveshaft during said axial movement with the cylinder;

(h) means for substantially preventing rotational motion of said first and second pistons comprising at least one linear track formed within said cylinder and cam follower means coupled to at least one of said first and second pistons and captively engaged by said linear track; and

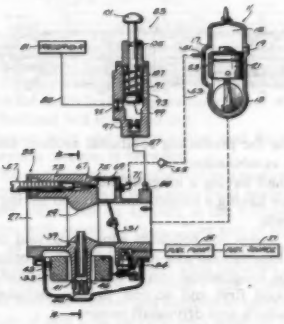
(i) wherein said valve means admits a fluid alternately into the first and second ends of said cylinder in order to alternately pressurize the first and second ends of said cylinder and to force the first and second pistons, respectively, to move toward the second and first ends of said cylinder, respectively, and wherein said valve means exhausts fluid alternately from the first and second ends of said cylinder for allowing the first and second pistons, respectively to freely move toward the first and second ends of said cylinder, respectively, and wherein said valve means is responsive to the angular position of said driveshaft for controlling the admission and exhaust of fluid to and from, respectively, the first and second ends of said cylinder, and a cam member rigidly attached to said driveshaft with said cam member including a cam face which is inclined relative to said driveshaft axis and said cam face abutting against said valve means for actuating said valve means depending upon the angular position of said driveshaft.

4,462,346

DUAL FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE

David F. Haman, Waukegan, and Dale M. Needham, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 9, 1982, Ser. No. 406,446
Int. Cl.³ F02M 1/16
U.S. Cl. 123—73 A **6 Claims**



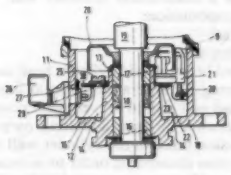
1. An internal combustion engine comprising a crankcase, a cylinder extending from said crankcase and defining a combustion chamber having an inlet port, a transfer passage communicating between said crankcase and said inlet port, a carburetor having an air induction passage communicating with said crankcase and including a venturi, a throttle valve intermediate said venturi and said crankcase, and a high speed nozzle communicating between said venturi and a source of operating fuel for normal operation, a low speed fuel nozzle communicating with said transfer passage adjacent said inlet port, a fuel line communicating between said low speed nozzle and said source of operating fuel, said fuel line including check valve means for preventing flow from said combustion chamber and permitting flow to said combustion chamber and also including fuel flow metering means, a reservoir for a primer fuel different from said operating fuel, and a primer fuel pump communicating with said primer fuel reservoir and with one of said induction passage, said crankcase, said transfer passage and said combustion chamber, said primer fuel pump being manually operable to deliver primer fuel to said one of said induction passage, said crankcase, said transfer passage and said combustion chamber.

4,462,347

IGNITION DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE

Hartmut Brammer, Vaihingen, and Harry Kaiser, Markgröningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,743
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138390
Int. Cl.³ F02P 7/02
U.S. Cl. 123—146.5 A **9 Claims**



1. Ignition distributor for an internal combustion engine, having a casing providing a two-bushing bearing, a shaft rotatably set in said bearing, an annular plate in said casing perpendicular to the axis of said shaft and abutting said bearing, a pulse generator of which the stationary portion is affixed to said plate, and comprising the improvement which consists in that:

said casing (10) includes a centrally upstanding shell (12) of said bearing and has at least three internal ribs (14) upstanding from the bottom of the casing and each having a radial extremity and a shoulder (15), rising higher than the radial extremity of the rib and abutting said bearing shell (12), for supporting said plate, and

said plate (23,33) is fastened to said ribs (14) by screws (25).

4,462,348

ENGINE STARTING SYSTEM

Dante S. Giardini, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

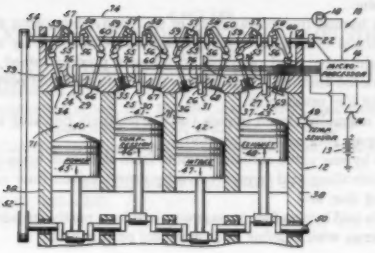
Filed Aug. 31, 1981, Ser. No. 297,674
Int. Cl.³ F02N 17/00
U.S. Cl. 123—179 R **21 Claims**

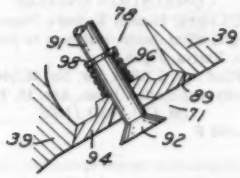
12. An engine starting system for a multi-cylinder four-stroke internal combustion engine having cylinders and pistons that are in intake and power stroke modes;

said starting system being characterized by:

feed means for feeding fuel into both of said cylinders simultaneously to create fuel and air mixture therein;

ignition means to ignite said fuel and air mixture contained within said cylinders; and





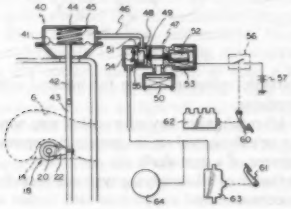
enclosing means to trap the explosive pressure of said ignited fuel in said cylinders to move both of said pistons.

4,462,349

FLOW CONTROL DEVICE OF A HELICALLY-SHAPED INTAKE PORT FOR USE IN A DIESEL ENGINE

Katsuhiko Motosugi, Toyota, and Ituo Koga, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 4, 1982, Ser. No. 404,990
Claims priority, application Japan, Nov. 4, 1981, 56-163721
Int. Cl.³ F01L *3/06*
U.S. Cl. 123—188 M **12 Claims**



1. A device for controlling the flow in a helically-shaped intake port of a diesel engine equipped with a suction pump which has a suction port and is driven by the diesel engine, said intake port comprising a helical portion formed around an intake valve, and a substantially straight inlet passage portion tangentially connected to the helical portion and having a helix terminating portion, said device comprising:

a bypass passage branched off from the inlet passage portion and connected to the helix terminating portion of the helical portion;

valve means arranged in said bypass passage for controlling the flow area of said bypass passage;

vacuum operated apparatus having a vacuum chamber and connected to said valve means for actuating said valve means in response to a change in the level of vacuum produced in said vacuum chamber; and

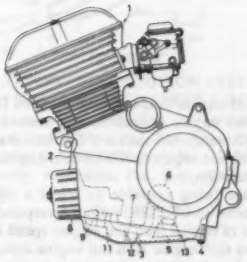
control means for selectively connecting said vacuum chamber (A) to the suction port of said suction pump in response to a change in a level of load of the diesel engine to open said valve means when the level of load of the engine is larger than a predetermined level, and; (B) to atmosphere in response to a change in the level of load to close said valve means when the level of load is smaller than a predetermined level.

4,462,350

LUBRICATION APPARATUS IN INTERNAL COMBUSTION ENGINE

Noboru Kurata, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,185
Claims priority, application Japan, Sep. 28, 1981, 56-142621[U]
Int. Cl.³ F01M *1/00*
U.S. Cl. 123—196 CP **5 Claims**



1. A lubrication apparatus in an internal combustion engine having a crank chamber comprising:

(a) an oil pan detachably mounted on the lower surface of said crank chamber;

(b) an oil pump having an oil intake opening;

(c) an oil filter;

(d) oil passage means provided in said crank chamber coupling said oil filter and said oil pump; and

(e) a relief valve provided in said oil passage means, said relief valve being opened by an oil pressure above a predetermined value, wherein said oil passage means includes an opening directed towards the oil pan, and said oil pan includes support means, and wherein said relief valve is inserted in said opening and is fixedly supported therein by being clamped between said support means of said oil pan and said oil passage means.

4,462,351

SPLIT TYPE INTERNAL COMBUSTION ENGINE

Hiroshi Fujii, and Sigeru Kamegaya, both of Tokyo, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

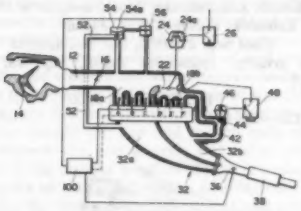
Filed Feb. 18, 1983, Ser. No. 467,906
Claims priority, application Japan, Feb. 25, 1982, 57-29174
Int. Cl.³ F02D *17/02*
U.S. Cl. 123—198 F **9 Claims**

1. An internal combustion engine comprising:

(a) first and second cylinder units each including at least one cylinder;

(b) an induction passage having therein a throttle valve, said induction passage being divided downstream of said throttle valve into first and second intake passages respectively communicating with said first and second cylinder units, said second intake passage having a stop valve near its entrance;

(c) an exhaust passage;
(d) an EGR passage connected from said exhaust passage to said induction passage downstream of said throttle valve, said EGR passage having therein an EGR valve whose position determines the flow area for exhaust gases through said EGR passage;
(e) a control unit for closing said stop valve and disabling said second cylinder unit to shift said engine from full engine operation to split engine operation when the engine load falls below a predetermined value, said control unit comprising a computer responsive to signals indicative of engine speed and engine load, said computer including:
memory means having first and second tables, said first table storing signals with values indicative of EGR ratio as



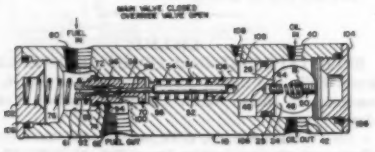
functions of engine load and engine speed for said engine being in full engine operation, said second table storing signals with values indicative of EGR ratio as functions of engine load and engine speed for said engine being in split engine operation;
said computer being operable to select a signal having a value indicative of EGR ratio corresponding with the conditions of engine load and engine speed from said first table when said engine is in full engine operation or from said second table when said engine is in split engine operation; and
means responsive to the selected signal having a value indicative of EGR ratio for controlling the position of said EGR valve.

4,462,352

ENGINE PROTECTIVE DEVICE RESPONSIVE TO LOW OIL PRESSURE

J. T. Mills, Houston, Tex., assignor to Sentinel Manufacturing Co., Inc., Denver, Colo.

Continuation of Ser. No. 296,193, Aug. 25, 1981, Pat. No. 4,399,785. This application Jun. 15, 1983, Ser. No. 504,491
Int. Cl.³ F02B 77/08
U.S. Cl. 123—198 DB **17 Claims**



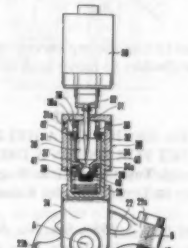
1. An apparatus for controlling the flow of fuel in a fuel supply line of an internal combustion engine in response to pressure in the engine's lubricating system and comprising:
(a) a main body having a main fuel passageway therein;
(b) a fuel inlet port and a fuel outlet port, each port communicating with said main fuel passageway and adapted to be connected to the fuel supply line of an internal combustion engine;
(c) a lubricant pressure sensor for sensing the pressure in the engine's lubricating system;
(d) a main valve in said main fuel passageway for controlling the normal flow of fuel between said fuel inlet port and said fuel outlet port, said main valve closing when the lubricant pressure sensor indicates that the pressure in the engine's lubricating system is below a predetermined value;
(e) a bypass fuel passageway in said body, bypassing that portion of said main fuel passageway controlled by said main valve, and operable to allow a predetermined restricted amount of fuel to flow from said fuel inlet port to said fuel outlet port;
(f) a normally closed bypass valve selectively blocking said bypass fuel passageway; and
(g) a bypass valve actuator remote from said main body and controlling said bypass valve by a pressurized fluid control line; and
wherein said bypass fuel passageway is at least partly outside of boundaries which define said main fuel passageway.

4,462,353

VARIABLE CYLINDER DEVICE FOR INTERNAL COMBUSTION ENGINES

Fuminao Arai, Chiryu; Hisashi Kodama, Nagoya, and Yoshio Okabe, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 6, 1983, Ser. No. 482,445
Claims priority, application Japan, Apr. 15, 1982, 57-062693
Int. Cl.³ F02D 13/06
U.S. Cl. 123—198 F **2 Claims**



1. A variable cylinder device for internal combustion engines comprising:
a valve lift mechanism having a rocker arm which causes an intake or exhaust valves to operate in response to a rotary movement of a cam-shaft,
a lash adjuster of oil-supplying type connected to said valve lift mechanism and coupled to said rocker arm so as to define a first rocking point of said rocker arm, said lash adjuster including a plunger slidably disposed within an adjuster body so as to define a reservoir and a pressure chamber, and a check ball positioned between said reservoir and said pressure chamber to allow only the flow of fluid from said reservoir into said pressure chamber, said rocker arm having one end which is brought in contact with a cam-surface of said cam-shaft and the other end which is securely connected to a valve stem of said intake or exhaust valve to thereby define the second rocking point, and
a solenoid valve having a valve stem which is actuated in accordance with input signals from the engine to thereby push said check valve into a position wherein a passage between said reservoir and said pressure chamber is opened, whereby the rocking point of said rocker arm is

shifted from the first rocking point to the second rocking point so as to maintain the closed position of said intake or exhaust valve.

4,462,354

STARTING AIDS FOR INTERNAL COMBUSTION ENGINES

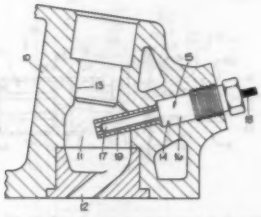
Richard P. Knowles, Farnborough, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 110,599, Jan. 9, 1980, abandoned. This application Apr. 27, 1982, Ser. No. 372,399

Claims priority, application United Kingdom, Feb. 1, 1979, 7903600

Int. Cl.³ F02B *3/02*; F02M *31/00*

U.S. Cl. 123—255 **5 Claims**



1. An internal combustion engine including means defining a combustion chamber, a first bore opening into the combustion chamber to accommodate a fuel injection nozzle, a second bore opening into the combustion chamber, said second bore having an outer screw threaded portion, an intermediate plane portion and an inner plane portion, the inner portion having a smaller diameter than the intermediate portion, an electric starting aid located within said second bore, said starting aid having a body which extends within the intermediate and outer portions of the bore, said body having an outer screw threaded portion the threads of which engage the threads of the outer portion of the bore, a tubular extension mounted on said body, said tubular extension extending through the inner portion of the bore into the combustion chamber, a wound heating element located within the end of the tubular extension remote from the body, said element in use, being heated by the passage of electric current to provide a heated surface in the combustion chamber to assist the ignition of fuel therein, an annular elongated member located about said extension, said member being formed from a material capable of withstanding the working conditions within the combustion chamber, at least a substantial portion of the inner surface of the member being disposed in spaced relationship to the surface of said extension, and an aperture in the wall of said elongated member, said elongated member at its end adjacent the body defining a flanged portion which is trapped between the body and a step defined at the junction of the intermediate and narrower portions of the bore.

4,462,355

THROTTLE VALVE CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Syunzaburo Ozaki, Sakado, and Tooru Niwa, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

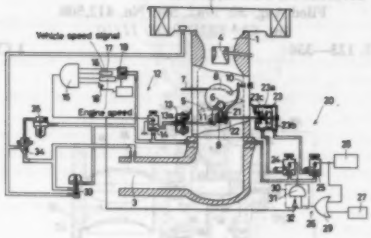
Filed Mar. 22, 1983, Ser. No. 477,668

Claims priority, application Japan, Mar. 24, 1982, 57-45571

Int. Cl.³ F02M *3/06*

U.S. Cl. 123—325 **2 Claims**

1. A throttle valve control apparatus in an internal combustion engine having an idle-speed increasing means for causing a throttle valve in an intake passage of an engine to open beyond a predetermined idling position thereof according to increase in an engine load, and a valve closing means for permitting the throttle valve to close beyond the predetermined idling position at the time of closing operation of the throttle valve, for deceleration or the like, characterized in that there is



provided a restraining means for restraining the operation of the idle-speed increasing means during the operation of the valve closing means.

4,462,356

MAGNETO POWERED IGNITION SYSTEM WITH IGNITION-OPERATED SPEED LIMITING

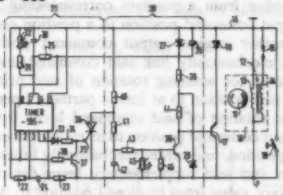
Adam Hirt, Ammerndorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,352

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1981, 3137550

Int. Cl.³ F02P *9/00*

U.S. Cl. 123—335 **14 Claims**



1. Magneto powered ignition system for an internal combustion engine incorporating engine-speed limiting of the intermittent ignition-suppression type, said system comprising primary and secondary ignition windings, a contactless electrically controlled switch means with a control circuit responsive to ignition timing signals in circuit with said primary winding, means including an engine driven magneto generator for providing power to said ignition windings and engine-driven ignition timing signal generator means, a monostable multivibrator stage for enabling operation of the ignition system so long as the engine speed does not exceed a predetermined limit by providing an input to the control circuit of said switch means, and further comprising the combination of:

means, including a magneto generator winding (13) serving in circuit as said primary ignition winding and also as a winding of said engine driven generator means for ignition energization from generated current and for providing both the signal voltage (Up) for triggering said monostable multivibrator stage and the electrical energy supply for the control circuit (20) of said switch means (17),

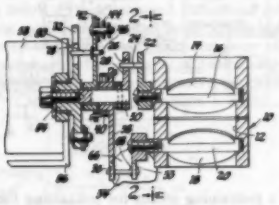
and means for applying, to the input of said monostable multivibrator, voltage half-waves of said generator winding (13) circuit (16) which are of a polarity opposite to that of voltage half-waves in said generator winding (13) circuit (16) utilized for ignition power and timing.

4,462,357

THROTTLE SYSTEM

Bruce D. Lockhart, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1982, Ser. No. 412,508
Int. Cl.³ F02D 9/08, 11/10
U.S. Cl. 123—336 1 Claim



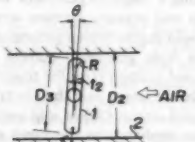
1. A throttle system for controlling air flow through an engine air induction passage, said throttle system comprising principal and supplementary throttle valves disposed in series in said induction passage, each of said valves being rotatable from a closed position through partially open positions to a wide open position, a principal lever secured to said principal valve and a supplementary lever secured to said supplementary valve, a command lever rotatable from a minimum engine output command position through partial engine output command positions to a maximum engine output command position, electronically controlled means connected to said principal lever and at least at times responsive to rotation of said command lever from one engine output command position to another engine output command position for rotating said principal valve from a position corresponding to said one engine output command position to a position corresponding to said another engine output command position, means adapted to mechanically link said command lever and said principal lever for assuring rotation of said principal valve from its closed position to at least a partially open position in response to rotation of said command lever from a partial engine output command position to its maximum engine output command position, and means mechanically linking said command lever and said supplementary lever for rotating said supplementary valve from its closed position to its wide open position in response to rotation of said command lever from its minimum engine output command position to a partial engine output command position.

4,462,358

THROTTLE VALVE

Takashi Ishida, Ohi, and Noboru Tominari, Tokyo, both of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,285
Claims priority, application Japan, May 25, 1981, 56-78051
Int. Cl.³ F02M 9/08
U.S. Cl. 123—337 2 Claims



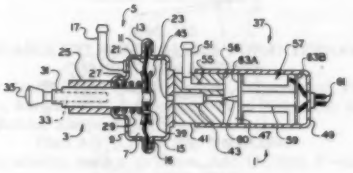
1. A throttle valve disposed within the intake bore of an internal combustion engine, said valve comprising a movable plate member having a thickness that is more than 1.5 mm and less than about 1/10 of its diameter, the circumferential edge of the valve being rounded with a radius less than about five times as large as said valve thickness, and the full closed angle of the valve being less than 5° relative to a plane forming a right angle with the center line of the intake bore.

4,462,359

PULSED BLEED AIR THROTTLE POSITION CONTROLLER

J. Joseph Muller, St. Louis, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,742
Int. Cl.³ F02M 3/00
U.S. Cl. 123—339 8 Claims



1. Apparatus for controlling the position of a carburetor throttle valve and thereby the idle speed of an engine on which the carburetor is mounted comprising:

means contacting a lever attached to one end of a throttle shaft on which the throttle valve is mounted to limit movement of the lever in one direction and to move the lever in the opposite direction;

vacuum means operating under vacuum pressure for maintaining the contact means in one position and for moving the contact means from one position to another, the vacuum means including a chamber exposed to vacuum; and,

electrically operated means including a variable position solenoid for bleeding air to the chamber to modulate the vacuum pressure therein, the electrically operated means also including an air-flow passage communicating with the chamber and means controlling flow of air through the passage to the chamber thereby to maintain the vacuum in the chamber at one level and to change it from one level to another, and the electrically operated means further including an air flow block having a central bore therein which defines said air flow passage and an inlet end thereof and with flow restrictions at each end of the central bore, and a passage for introducing outside air into the apparatus, the outlet of the outside air passage and said inlet end of the central bore being in a common plane defined by a cross section of a wall of the air flow block, and wherein said means controlling flow of air variably controls the cross sectional area of said inlet of end of the central bore.

4,462,360

ENGINE IDLING ROTATIONAL SPEED CONTROL DEVICE

Nobuyuki Kobayashi; Hiroshi Ito, and Takahide Kuma, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 11, 1982, Ser. No. 407,172
Claims priority, application Japan, Aug. 13, 1981, 56-126889
Int. Cl.³ F02D 33/00
U.S. Cl. 123—339 7 Claims

1. An engine idling rotational speed control device comprising:

a throttle valve arranged in a first air intake passage;

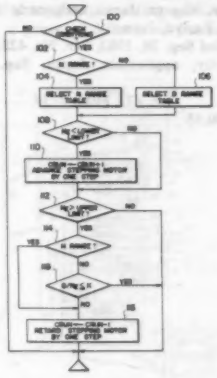
intake air flow rate control means arranged in a second air

intake passage for controlling intake air quantity taken from said second air intake passage into an engine;

a rotational speed sensor for sensing a rotational speed of said engine;

an air flow rate sensor for sensing air quantity taken into said engine; and

an electronic control circuit for driving said intake air flow rate control means such that the rotational speed of said engine in a substantially full-close position of said throttle valve is brought into a target rotational speed range re-



lated to at least an engine coolant temperature, comparing a value related to the intake air quantity sensed by said air flow rate sensor and the engine rotational speed sensed by said rotational speed sensor with a reference, determining, based on the result of comparison, if said intake air flow rate control means is to be downward controlled in a manner to decrease the air quantity taken from said second air intake passage, and, if a decision is is made that said intake air flow rate control means is not to be downward controlled.

4,462,361

APPARATUS FOR GENERATING A FUEL QUANTITY SIGNAL

Anton Karle, Leonberg, and Helmut Laufer, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

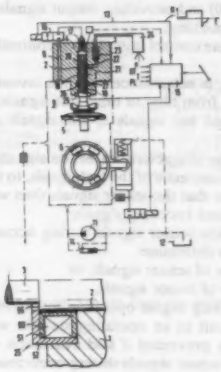
Filed Sep. 21, 1982, Ser. No. 420,777

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148688

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—357 **10 Claims**

1. An apparatus for generating a fuel quantity signal in an injection pump of an internal combustion engine having a pump piston actuated by a cam disk which cam slope is constant in the metering range, said pump piston encloses a pump work chamber connectable with a fuel inlet conduit and at least one outlet supply line, said fuel inlet conduit being provided with an electrically operated metering valve, a position-sensor means cooperating with said pump piston for generating a metering onset signal, and said electrically operated valve



having a voltage supply means from which is derivable a metering endsignal upon closure of said valve.

4,462,362

ENGINE KNOCK CONTROL SUPERVISORY SYSTEM

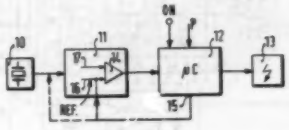
Jörg Bonitz, Mühlacker; Robert Entenmann, Benningen; Rochus Knab, Kornwestheim; Siegfried Rohde, Schwieberdingen, and Herbert Schramm, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,421

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128475

Int. Cl.³ F02B *5/14*

U.S. Cl. 123—425 **13 Claims**



1. Engine knock control supervisory system for an internal combustion engine having

a knocking sensor (10) providing a knocking signal upon sensing engine knocking, and background noise signals;

an evaluation circuit (11) connected to and controlled by the sensor (10) and providing output signals representative of engine knocking;

an engine control unit (12, 13) controlling engine operation; and comprising, in accordance with the invention,

means (12, 18) for generating, from time to time, test signals;

means (15) connected to and controlling the signals derived from the sensor during occurrence of the test signals, to change their relative characteristics so that the signals then will be in the form of simulated knocking signals;

and means (22) for acting on said engine control unit (12, 13) and controlling said engine control unit to change the operating conditions of the engine in a direction in which knocking is prevented upon determination of failure of detection of knocking in the evaluation circuit (11) in response to said simulated knocking signals during occurrence of the test signals.

9. Method of monitoring an engine knock control system for an internal combustion engine, in which the engine knock

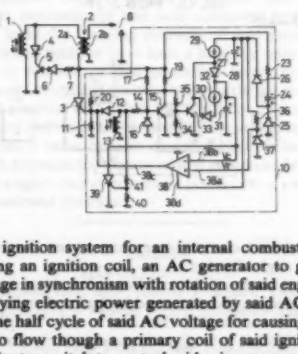
control system has a sensor (10) providing a knocking signal upon sensing engine knocking and background noise signals;
an evaluation circuit (11) connected to and controlled by the sensor (10) and providing output signals representative of engine knocking;
and an engine control unit (12, 13) controlling engine operation,
comprising, in accordance with the invention, the steps of
generating, from time to time, test signals;
applying said test signals to the signals derived from the sensor;
changing the characteristics of the signals from the sensor, during occurrence of the test signals, to simulate knocking signals, so that the sensor signals then will be in the form of simulated knocking signals;
evaluating the sensor signals during occurrence of the test signals to determine:
(a) presence of sensor signals, or
(b) absence of sensor signals,
and controlling engine operation by controlling said engine control unit to an operating state in which knocking is positively prevented if said evaluation step indicates absence of sensor signals during occurrence of the test signals.

4,462,363

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hirotoshi Nanjyo, Mishima; Hiroshi Serizawa, Gotenba, and Michio Sagae, Namazu, all of Japan, assignors to Kokusan Denki Co., Ltd., Shizuoka, Japan

Filed Oct. 14, 1981, Ser. No. 312,262
Claims priority, application Japan, Oct. 14, 1980, 55-146050[U]; Nov. 28, 1980, 55-170463[U]
Int. Cl.³ F02P 5/08
U.S. Cl. 123—427 **9 Claims**



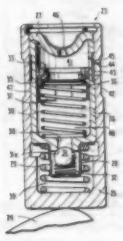
1. An ignition system for an internal combustion engine comprising an ignition coil, an AC generator to generate an AC voltage in synchronism with rotation of said engine, means for supplying electric power generated by said AC generator during one half cycle of said AC voltage for causing a primary current to flow though a primary coil of said ignition coil, a semiconductor switch to control said primary current through said primary coil, a signal coil to generate a signal of one cycle per one revolution of said engine in synchronism therewith and an ignition position control circuit to produce a conducting signal for causing conduction of said semiconductor switch with said signal from said signal coil used as a control signal, said semiconductor switch being caused to conduct so that said primary current rapidly varies whereby said engine is ignited, characterized in that said ignition position control circuit comprises;
capacitor means;
a capacitor charging circuit to charge said capacitor means with one polarity from a power source capacitor which is in turn charged through a unilateral element by said AC voltage of another half cycle from said AC generator;
a capacitor discharging circuit having a discharge control switch to be caused to conduct during the leading half cycle of said signal from said signal coil to discharge said capacitor means through said discharge control switch;
a reference voltage generating circuit to generate a reference voltage of a value lower than the maximum value of a voltage across said capacitor means;
and a conducting signal generating circuit to generate said conducting signal when said voltage across said capacitor means becomes lower than said reference voltage.

4,462,364

HYDRAULIC LASH ADJUSTER

Hisashi Kodama, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1982, Ser. No. 425,775
Claims priority, application Japan, Sep. 30, 1981, 56-145645[U]
Int. Cl.³ F01L 1/34
U.S. Cl. 123—90.55 **4 Claims**



1. A hydraulic lash adjuster comprising a hollow cylindrical body having a bottom at one end thereof, a hollow cylindrical plunger having an apertured bottom slidingly disposed in said body with leakage clearance therebetween defining a reservoir chamber within said plunger and a pressure chamber between the bottom of said plunger and the bottom of said body, first check valve means operatively associated with the apertured bottom of said plunger for controlling the flow of fluid from said reservoir chamber to said pressure chamber, cup means operatively associated with one end of said plunger for operative engagement with the push rod in a valve mechanism, first and second annular grooves located in the outer surface of the said body and said plunger respectfully, first and second port means located in the bottom of each of said grooves with said grooves and ports being operatively associated with each other for supplying a fluid through said body and said plunger to said reservoir chamber, annular valve seat means disposed in said plunger between said port in said plunger and the bottom of said plunger and second check valve means associated with said valve seat means on the side thereof towards the bottom of said plunger for controlling the flow of fluid from said port in said plunger to said reservoir chamber.

4,462,365

APPARATUS FOR SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE

Junzo Uozumi, Nagoya, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

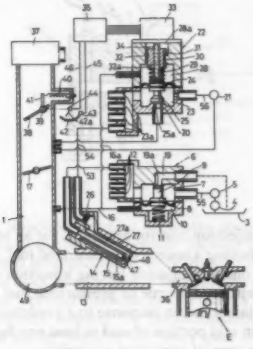
Filed Jun. 20, 1983, Ser. No. 505,936
Claims priority, application Japan, Oct. 21, 1982, 57-186259
Int. Cl.³ F02B 33/00
U.S. Cl. 123—438 **9 Claims**

1. An apparatus for supplying fuel to an internal combustion engine including a fuel pump, an air pump, an air intake passage, a nozzle mounted in said air intake passage and adapted to communicate with said fuel pump and said air pump, said nozzle having a discharge opening which opens into said air intake passage, an air restriction and a fuel restriction which lead to said discharge opening, an air valve mounted in said air

intake passage and a throttle valve provided downstream of said air valve, wherein fuel and air passing through said fuel restriction and said air restriction are mixed in said nozzle and are injected from said discharge opening to said air intake passage, said apparatus comprising:

an air regulator located at an air passage between said nozzle and said air pump for generating an air pressure P_a and maintaining a pressure differential between pressure in said air intake passage and said air pressure P_a at a predetermined value corresponding to engine operations;

a fuel regulator located at a fuel passage between said nozzle and said fuel pump for generating a fuel pressure P_f and maintaining a pressure differential between pressure in



said air intake passage and said fuel pressure P_f at a predetermined value corresponding to engine operations;

an air sensor for sensing the amount of suction air into said air intake passage and outputting a signal corresponding to said amount of suction air;

a computer for receiving said signal from said air sensor and outputting a signal corresponding to a predetermined pressure differential between said air pressure P_a and said fuel pressure P_f, said pressure differential corresponding to said signal from said air sensor; and

means located at at least one of said fuel passage and said air passage for receiving a signal from said computer and maintaining said pressure differential between said air pressure P_a and said fuel pressure P_f at a required value.

4,462,366

AIR-FUEL RATIO CONTROL CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Nomura, Okazaki; Yukihiro Watanabe, Nagoya, and Keiiti Yamamoto, Okazaki, all of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

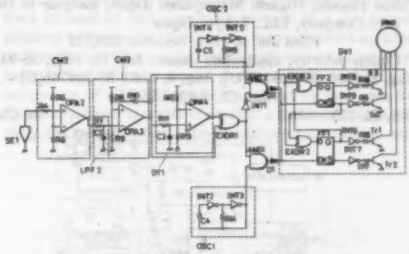
Filed Mar. 15, 1983, Ser. No. 475,506

Claims priority, application Japan, Mar. 29, 1982, 57-45105[U]

Int. Cl.³ F02M *7/00, 7/18*

U.S. Cl. 123—440 **3 Claims**

1. An air-fuel ratio control circuit for an internal combustion engine comprising a low-pass filter; a hysteresis type comparator; a delay timer, output signals from an exhaust gas sensor being transmitted through said low-pass filter to said hysteresis type comparator and then to said delay timer; and a pulse motor for controlling air-fuel ratio of said internal combustion engine and adapted to be driven in either forward or reverse direction determined by the output of said comparator at high speeds for a specified period of time determined by said delay timer at each time when the output of said comparator is inverted wherein said pulse motor is driven at low speeds after the specified period of time has elapsed, and the time constant



of said low-pass filter is set longer than the delay time of said delay timer.

4,462,367

FUEL CONTROLLER FOR INTERNAL COMBUSTION ENGINE

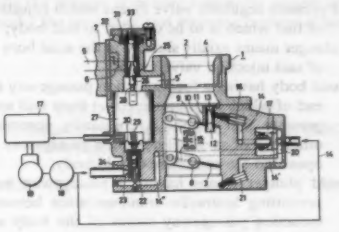
Yoshiyuki Tanabe; Mineo Kashiwaya; Akira Hikichi, and Yoshikazu Aochi, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1983, Ser. No. 471,436

Claims priority, application Japan, Mar. 4, 1982, 57-34929

Int. Cl.³ F02B *29/2*

U.S. Cl. 123—442 **5 Claims**



1. A fuel controller for controlling fuel supply to an internal combustion engine comprising;

a venturi portion formed in an air-intake path adapted to feed air to said internal combustion engine;

a throttle valve installed in said air-intake path on the downstream side of said venturi portion;

an auxiliary throttle valve installed between said throttle valve and said venturi portion;

a fuel injection portion provided between said throttle valve and said venturi portion and injecting fuel fed through a fuel path;

a bypass air path formed to have one end opened at said venturi portion and the other end opened at the upstream side thereof;

a sensor means provided in said bypass air path for detecting an amount of air passing therethrough;

a means provided in said bypass air path for controlling the amount of air passing therethrough at a constant level;

a means provided in a fuel path communicating with said fuel injection portion for controlling an amount of fuel passing through said fuel path in accordance with the amount of air passing through said air-intake path; and

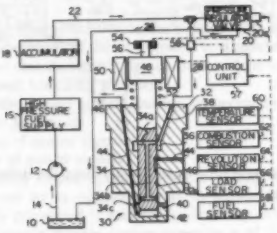
a link mechanism for operating said auxiliary throttle valve and said throttle valve interlockedly.

4,462,368

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Takeo Funada, Higashi Matsuyama, Japan, assignor to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,732
Claims priority, application Japan, Jul. 10, 1980, 55-93262; Aug. 2, 1980, 55-109127[U]; Aug. 4, 1980, 55-109745[U]
Int. Cl.³ F02N 57/02
U.S. Cl. 123—446 26 Claims



1. A fuel injection system for an internal combustion engine comprising:

a source of high pressure fuel supply hydraulically connected with a fuel tank or reservoir which stores liquid fuel therein through a lower pressure supply pump;

an accumulator which accumulates therein high pressure fuel from said high pressure fuel supply source;

injection valve means having a body formed with an axial bore and a nozzle hole;

a pressure regulator valve means which adjusts the pressure of fuel which is to be coupled to said body;

plunger means axially slidable in the axial bore of said body of said injection valve means;

said body having a fuel induction passageway means at one end of which high pressure fuel from said source of high pressure fuel supply is constantly communicated, the other end of said fuel induction passageway means being open into the axial bore of said body;

said plunger means having a passageway means therein permitting hydraulic communication between said fuel induction passageway means of the body and a nozzle hole therethrough;

drive means driving said plunger means for a downward or injection stroke and an upward or return stroke in the axial bore of said body, whereby injection of fuel under high pressure is started when said passageway means in said plunger means is communicated with said fuel induction passageway and said nozzle hole in said body upon the injection stroke of said plunger means and terminated when communication between said passageway and said nozzle hole is interrupted upon the return stroke of said plunger means; and

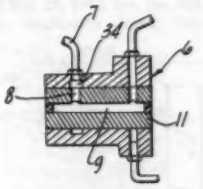
electric control means for controlling the operations of said drive means and said pressure regulator valve means, said electric control means comprising a control unit and pressure sensor means for sensing the injection pressure, said pressure sensor means comprising a pick-up means disposed in a passage which entends from said pressure regulator valve means to said injection valve means, said electric control means also comprising a stroke sensor means sensing the axial position of said plunger means, said electric control means further comprising revolution sensor means sensing the speed of said engine, whereby said electric control means is operable to control the operation of said drive means to thereby control the injection starting and terminating points at controlled timing and also to control the guantity of the injection of fuel in response to output signals from said stroke sensor means, said revolution sensor means and said pressure sensor means.

4,462,369

FUEL INJECTION APPARATUS DESIGNED FOR AN INTERNAL-COMBUSTION ENGINE

Jean-Louis Dazzi, Saint Genis Laval, and Jean-Louis Froment, Lyons, both of France, assignors to Renault Vehicules Industriels, Lyons, France

Filed Dec. 15, 1980, Ser. No. 216,333
Claims priority, application France, Dec. 14, 1979, 79 31353
Int. Cl.³ F02B 19/00; F02M 59/00
U.S. Cl. 123—450 6 Claims



1. A fuel injection control apparatus for an internal combustion engine having a source of pressurized fuel, a fuel reservoir and at least one fuel injector having a portion normally interconnected with said source of pressurized fuel and selectively operable in inject fuel in response to a predetermined decrease of pressure in said portion of said at least one fuel injector, said fuel injector control apparatus comprising:

a valve body;

a first passageway means formed in said valve body and interconnectable with said portion of said at least one fuel injector;

a second passageway means formed in said valve body and interconnectable with said source of pressurized fuel;

a third passageway means formed in said valve body and interconnectable with said fuel reservoir;

a fourth passageway means and a fifth passageway means each formed in said valve body and each interconnecting said first and second passageway means;

a sixth passageway means and a seventh passageway means each formed in said valve body and each interconnecting said first and said third passageway means;

first valve means crossing each of said fourth, fifth, sixth and seventh passageway means and reciprocating thereacross between a first position opening said fifth and sixth passageway means and closing said fourth and seventh passageway means and a second position opening said fourth and seventh passageway means and closing said fifth and sixth passageway means; and

second valve means crossing each of said fourth, fifth sixth and seventh passageway means and reciprocating between a first position opening said fifth and seventh passageway means and closing said fourth and sixth passageway means and a second position opening said fourth and sixth passageway means and closing said fifth and seventh passageway means such that, when both of said first and second valve means are in said first positions, said first passageway means is interconnected with said second passageway means and is disconnected from said third passageway means, and further such that when both of said first and second valve means are in said second positions, said first passageway means is interconnected with said second passageway means and is disconnected from said third passageway means, and still further such that when one of said first and second valve means is in its first position and the other of said first and second valve means is in its second position, said first passageway means is

disconnected from said second passageway means and is interconnected with said third passageway means.

4,462,370

FUEL INJECTION PUMPING APPARATUS

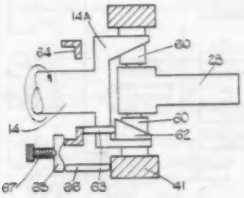
Boaz A. Jarrett, London, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 17, 1981, Ser. No. 331,823

Claims priority, application United Kingdom, Dec. 31, 1980, 8041546

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—450 **4 Claims**



1. A fuel injection pumping apparatus comprising an axially slidable rotary distributor member located in a surrounding body part and arranged in use to be rotated in timed relationship with an associated engine, a bore formed in the distributor member and a plunger slidable in said bore, a delivery passage in the distributor member for communication in turn with a plurality of outlet ports in the body part during successive inward movements of the plunger, said delivery passage communicating with said bore so that the fuel displaced by said plunger is supplied to an outlet port, a cam for imparting inward movement to said plunger as the distributor member rotates, supply means for supplying fuel to said bore to effect outward movement of the plunger, speed responsive means for varying the setting of the cam to provide timing adjustment stop means for controlling the extent of outward movement of the plunger said stop means being arranged to vary the extent of outward movement of the plunger in accordance with the axial position of the distributor member thereby to control the amount of fuel supplied by the apparatus to the engine, a coupling interposed between a drive shaft and the distributor member, said drive shaft in use being coupled to a rotary part of the associated engine, said coupling incorporating a helical peg and slot connection whereby as the distributor member is moved axially relative to the drive shaft angular movement of the distributor member relative to the drive shaft will occur to maintain the timing of delivery of fuel by the apparatus substantially constant.

4,462,371

FUEL PUMPING APPARATUS

Brian W. Tumber, Greenford, England, assignor to Lucas Industries Limited, Birmingham, England

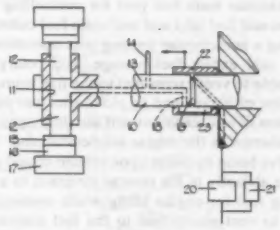
Continuation of Ser. No. 162,022, Jun. 23, 1980, abandoned. This application Dec. 21, 1982, Ser. No. 451,854

Claims priority, application United Kingdom, Sep. 8, 1979, 7931256

Int. Cl.³ F02M *39/00*; F04B *23/10*

U.S. Cl. 123—450 **3 Claims**

1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine and of the kind comprising a rotary distributor member, a plunger movable within a bore, a roller controlling movement of said plunger, a cam which includes a base circle and a plurality of cam lobes, each cam lobe having a leading flank for imparting inward movement to the plunger and a trailing flank, fuel displaced from said bore during inward plunger movement flowing by way of passage means in the distributor member to an outlet, a source of fuel under pressure and fuel inlet control means for controlling the amount of fuel supplied to the bore from said source thereby to control the quantity of fuel supplied by the apparatus at each delivery stroke of the plunger, characterized in that the trailing flank of each of said cam lobes extends to a location almost adjacent to the leading flank of the next adjacent cam lobe, said trailing flanks being gently sloped with respect to said cam ring base circle to thereby extend the time during which outward movement of said plunger is controlled by said cam lobe so that said plunger is under control of a trailing flank at substantially any angular orientation of said rotor distributor, said fuel



inlet control means being formed to establish fluid communication between said fuel source and said bore for a predetermined amount of time during which said roller is forced to constantly engage a trailing flank and moves a specific distance along said flank, the amount of fuel supplied to said plunger being directly related to said specific distance so that said trailing flank defines a metering portion and said inlet control means acts as an on/off valve to control the flow of fuel from said source to the bore while the plunger is moving outwardly against and constantly under the control of said metering portion of each cam lobe.

4,462,372

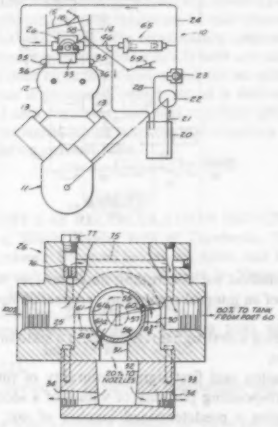
FUEL INJECTION SYSTEM

Maurus E. Jackson, 1905 Victory Blvd., Glendale, Calif. 91201

Filed Sep. 30, 1982, Ser. No. 431,767

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—452 **22 Claims**



1. A continuous flow fuel injection system for use on a racing engine equipped with accelerator controlled butterfly throttle valve means connected to an inlet of a supercharger discharging into the engine intake manifold, said fuel injection system being characterized by having in combination:

a positive displacement fuel pump adapted to be driven by the engine and having a capacity at least equal to maximum engine needs;

fuel metering valve means having an inlet connected to an outlet of said pump and having a non-circular main fuel outlet passage discharging into air flowing to the engine intake manifold and a non-circular excess fuel passageway connected to an fuel source by continuously open unrestricted duct means;

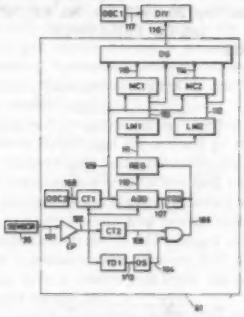
a rotary valve mounted in said metering valve means operatively connected to said throttle valve means and having a non-circular main fuel port for controlling fuel flow between said fuel inlet and said main fuel outlet passage, and having a non-circular venting port operatively associated with said excess fuel passage, said rotary valve being operable to vent excess fuel to the fuel source at the starting line of a race and to close after not in excess of 9° rotation of said valve toward the fully open throttle position thereof as the engine accelerates; and

said valve being operable upon release of said accelerator to rotate abruptly in the reverse direction to a position supplying fuel for engine idling while opening said venting port to vent excess fuel to the fuel source and avoid a harmful pressure condition on the outlet side of said fuel pump.

4,462,373
AIR-TO-FUEL RATIO CONTROL METHOD AND APPARATUS

Yoshiaki Kanno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1982, Ser. No. 407,363
Claims priority, application Japan, Aug. 12, 1981, 56-127494
Int. Cl.³ F02D 5/00
U.S. Cl. 123—489 **16 Claims**



1. A method for controlling an air-to-fuel ratio of an inlet mixture of an internal combustion engine, comprising the steps of:

providing a first signal representing a state of said air-to-fuel ratio;

integrating said first signal a plurality of times to obtain a corresponding plurality of values of a second signal;

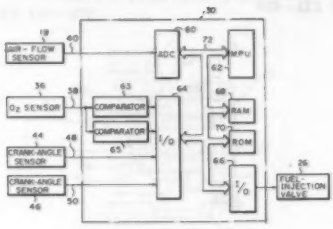
averaging a predetermined number of said values of said second signal to obtain an average value centered within a control width; and

providing a third signal for controlling said air-to-fuel ratio in accordance with said second signal and said control width, said third signal corresponding to said second signal limited in accordance with said control width.

4,462,374
AIR-FUEL RATIO CONTROL METHOD AND APPARATUS UTILIZING AN EXHAUST GAS CONCENTRATION SENSOR

Nobuyuki Kobayashi, Toyota, and Hiroshi Itoh, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 12, 1982, Ser. No. 407,560
Claims priority, application Japan, Aug. 13, 1981, 56-125989
Int. Cl.³ F02M 51/00
U.S. Cl. 123—489 **8 Claims**



1. An air-fuel ratio control method for an internal combustion engine, comprising the steps of:

detecting the concentration of a predetermined component in the exhaust gas to generate a first electrical signal which indicates the detected concentration;

detecting the rotational speed of the engine to generate a second electrical signal which indicates the detected rotational speed;

correcting the feeding rate of fuel supplied to the engine in accordance with said first electrical signal so as to execute a closed-loop air-fuel ratio control operation;

comparing said first electrical signal with a reference signal having a voltage to generate a third electrical signal which indicates that said first electrical signal is lower than the reference signal, the voltage of said reference signal being changed in accordance with said second electrical signal so as to decrease when the rotational speed increases and so as to increase when the rotational speed decreases; and

stopping the closed-loop air-fuel ratio control operation to execute an open-loop air-fuel ratio control operation when said third electrical signal is continuously produced for a time longer than a predetermined period of time.

5. An air-fuel ratio control apparatus for an internal combustion engine, comprising:

means for detecting the concentration of a predetermined component in the exhaust gas to generate a first electrical signal which indicates the detected concentration;

means for detecting the rotational speed of the engine to generate a second electrical signal which indicates the detected rotational speed;

means for correcting the feeding rate of fuel supplied to the engine in accordance with said first electrical signal so as to execute a closed-loop air-fuel ratio control operation;

means for comparing said first electrical signal with a reference signal having a voltage to generate a third electrical signal which indicates that said first electrical signal is lower than the reference signal, the voltage of said reference signal being changed in accordance with said second electrical signal so as to decrease when the rotational speed increases and so as to increase when the rotational speed decreases; and

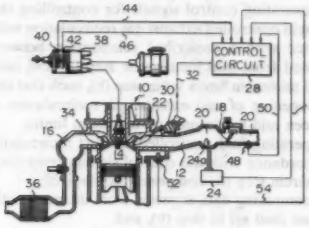
means for stopping the closed-loop air-fuel ratio control operation to execute an open-loop air-fuel ratio control operation when said third electrical signal is continuously produced for a time longer than a predetermined period of time.

4,462,375

METHOD AND APPARATUS FOR CONTROLLING FUEL SUPPLY OF AN INTERNAL COMBUSTION ENGINE

Toshiaki Isobe, Nagoya, and Nobuhisa Ohkawa, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 17, 1983, Ser. No. 476,405
Claims priority, application Japan, Mar. 23, 1982, 57-044645
Int. Cl.³ F02M 17/00
U.S. Cl. 123—491 10 Claims



1. A method of controlling the fuel supply of an internal combustion engine having combustion chambers, an intake manifold, and an air intake passage for introducing outer air into the combustion chamber, said method comprising the steps of:

detecting an engine running speed to produce a first electrical signal;

detecting an intake manifold pneumatic pressure to produce a second electrical signal;

detecting a temperature of the outer air of the engine to produce a third electrical signal;

detecting a temperature corresponding to the temperature of the air intake passage to produce a fourth electrical signal;

calculating, in response to the first and second electrical signals, a value which corresponds to a basic fuel feed to the engine;

determining, in response to the third electrical signal, a first correction coefficient by using a predetermined first function which indicates a relationship between the outer air temperature and the first correction coefficient, said first correction coefficient corresponding to an outer air temperature dependent coefficient at the time of a fully warmed-up condition;

determining, in response to the fourth electrical signal, a second correction coefficient by using a predetermined second function which indicates a relationship between the temperature and the second correction coefficient;

determining, in accordance with said first and second correction coefficients, a third correction coefficient, a changing rate of the third correction coefficient with respect to the outer air temperature increasing when the temperature decreases, and decreasing when the temperature corresponding to the air intake passage temperature increases;

correcting, in accordance with said third correction coefficient, the calculated value for the fuel feed so that the corrected value for the fuel feed is proportional to said third correction coefficient; and

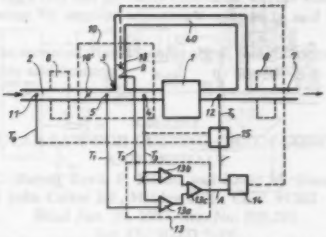
adjusting, in response to the corrected value for the fuel feed, the actual fuel feed to the engine.

4,462,376

METHOD AND APPARATUS FOR DETERMINING AND CONTROLLING THE EXHAUST GAS RECIRCULATION RATE IN INTERNAL COMBUSTION ENGINES

Wolfgang Ripper; Max Straubel, both of Stuttgart, and Wolf Wessel, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,328
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220832
Int. Cl.³ F02M 25/06
U.S. Cl. 123—571 6 Claims



5. An apparatus for determining and controlling the exhaust gas recirculation rate in an internal combustion engine which comprises an air intake tube, an engine, an exhaust gas tube and a recirculation line extending from said exhaust gas tube to said air intake tube, a temperature determining means (T4) in the exhaust gas tube of the engine upstream of an inlet into the exhaust gas recirculationg line which produces an output value of the temperature of exhaust gases, a regulator having a first input for receiving an output from said temperature-determining means (T4), and an adjusting member in the exhaust gas recirculation line for adjusting flow of gases through said recirculation line, a temperature-determining means (T0) in said air intake tube for measuring ambient air, a temperature-determining device (T1) in said intake tube just upstream of a connection of said recirculating exhaust tube and said air intake tube for measuring aspirated air temperature, an air temperature determining means (T3) in said air intake tube downstream of said connection, a temperature measuring device (T2) in said recirculating exhaust gas tube upstream of said connection, a computer circuit which links the temperature outputs of said temperature detecting means (T1, T2, T3) with one another in such a manner than an actual-value signal for an exhaust gas recirculation rate is produced, which signal is delivered to a second input of said regulator, and said regulator produces a difference output signal which controls said adjusting member in said recirculation exhaust tube.

4,462,377

EXHAUST GAS RECIRCULATION DEVICE

Takeshi Tanaka; Hisasi Kawai, both of Toyohashi; Toshihiko Igashira, Toyokawa; Kiyonori Sekiguchi, Aichi, and Takaharu Idogaki, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 20, 1982, Ser. No. 451,052
Claims priority, application Japan, Dec. 19, 1981, 56-204534
Int. Cl.³ F02M 25/06
U.S. Cl. 123—571 1 Claim

1. An EGR device for an internal combustion engine comprising:

an EGR pipe which forms a passage between an intake pipe and an exhaust pipe of the engine, for supplying a portion of the exhaust gas to the intake pipe;

an EGR valve body in said EGR pipe for changing the opening degree of said EGR pipe and regulating the amount of the recirculated exhaust gas;

casing means fixed to said EGR pipe;

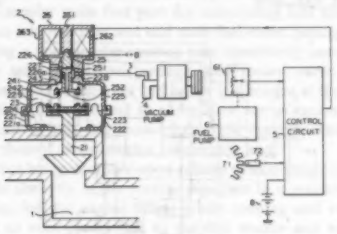
a diaphragm supported by said casing means and connected to said EGR valve body for forming a negative pressure chamber;

a bore-formed in said casing means;

a spool valve body movably fitted in said bore;

an atmospheric port and a negative pressure port formed in said casing means, said negative pressure port being connected to a negative pressure source;

a channel formed in said spool valve body, one port of said channel being open to said negative pressure chamber, while the other port of said channel being communicated



with either said atmospheric port or said negative pressure port according to the position of said spool valve body;

a spring in said negative pressure chamber arranged between said diaphragm and said spool valve body for forcing said spool valve body in the direction to realize the communication of said other port of said channel with said atmospheric port;

a solenoid fixed to said casing means for driving said spool valve in the direction to said diaphragm when said solenoid is excited; and

a control circuit for controlling the excitation of said solenoid in accordance with the engine running conditions.

4,462,378

CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE HAVING A CARBURETOR

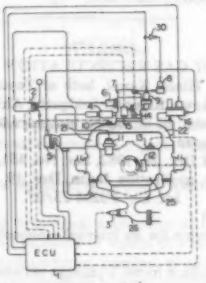
Takeshi Atago, Katsuta; Yasunori Mouri, Katsuta; Tokuo Kosuge, Katsuta; Toshio Furuhashi, Ibaraki; Osamu Abe, Katsuta, and Taiji Hasegawa, Nakaminato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 110,469, Jan. 8, 1980. This application Sep. 15, 1983, Ser. No. 532,524

Claims priority, application Japan, Jan. 16, 1979, 54-2195

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—571 **4 Claims**



1. A method of operating a processor-controlled apparatus for controlling the operation of an internal combustion engine having a carburetor through which the air-fuel ratio of the air-fuel mixture supplied to the engine is controlled, and a controlled exhaust gas recirculation path having an exhaust gas recirculation valve for controllably recirculating exhaust gas from an exhaust pipe of said engine to an intake pipe for said carburetor, comprising the steps of:

(a) storing, in memory, predetermined data defining prescribed operational control of said exhaust gas recirculation valve in accordance with prescribed engine operation conditions;

(b) in response to at least one preselected sensed engine operation condition, including the position of the throttle of said carburetor, setting a maximum limit and a minimum limit on said prescribed operational control of said exhaust gas recirculation valve, such that said maximum and minimum limits become larger as the opening degree of said throttle valve becomes larger;

(c) accessing from said memory data stored in step (a), based upon sensed engine operation conditions;

(d) generating control signals for controlling the operation of said controlled exhaust gas recirculation valve in accordance with a prescribed relationship between data accessed from said memory in step (c) and said maximum and minimum limits set in step (b), such that the duty ratio of opening of said exhaust gas recirculation valve is between said maximum and minimum limits;

(e) operating said controlled exhaust recirculation valve in accordance with the control signals generated in (d); and

wherein step (d) comprises the steps of:

(d1) comparing data accessed from memory with said maximum limit set in step (b), and

(d2) in response to the value of said accessed data exceeding said maximum limit, generating said control signals on the basis of said maximum limit.

4,462,379

EXHAUST GAS RECIRCULATING APPARATUS OF A DIESEL ENGINE

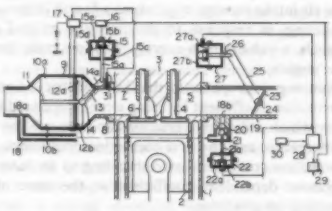
Noboru Tsuge, Kariya; Masahiro Taguchi, Okazaki; Masanori Kato, Toyoake, and Satosi Kuwakado, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 21, 1982, Ser. No. 420,941

Claims priority, application Japan, Oct. 29, 1981, 56-172099

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **9 Claims**



1. An exhaust gas recirculating apparatus of a diesel engine having an intake air passage and an exhaust gas passage, said apparatus comprising:

a bypass passage having an inlet and an outlet to allow a portion of the exhaust gas to recirculate from the exhaust gas passage into the intake air passage;

a normally closed first valve means in the bypass passage;

a normally open second valve means in the intake passage on the upstream side of the outlet of the bypass passage;

a means for trapping the particulate matter included in the exhaust gas, said trapper means being located upstream of said first valve means, and so that the recirculating gas can pass through it;

heater means incorporated with said trapping means to burn the particulate matter trapped therein;

a means for detecting the idle condition of the engine; and

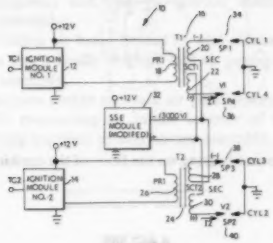
an actuating means responsive to the output of the idle detecting means for actuating said first and said second valve means so that when the engine is in the idle condition said first valve means is open and said second valve means is closed to a predetermined extent.

4,462,380

ENHANCED SPARK ENERGY DISTRIBUTORLESS IGNITION SYSTEM

Joseph R. Asik, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1982, Ser. No. 450,932
Int. Cl.³ F02P 3/04
U.S. Cl. 123—620 3 Claims



1. A distributorless ignition system with increased spark energy including:

a first ignition coil having a first primary winding and a first secondary winding including a first split secondary center tap;

a second ignition coil having a second primary winding and a second secondary winding including a second split secondary center tap;

a first ignition module coupled to said first primary winding;

a second ignition module coupled to said second primary winding;

a supplementary spark energy module coupled to said first split secondary tap and said second split secondary tap;

a first pair of spark plugs coupled to said first secondary winding; and

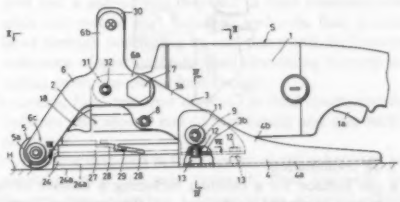
a second pair of spark plugs coupled to said second secondary winding.

4,462,381

POWER CUTTING TOOL

Fusao Fushiya, and Nobuhiro Inoue, both of Anjo, Japan, assignors to Makita Electric Works, Ltd., Aichi, Japan

Filed Apr. 15, 1982, Ser. No. 368,836
Claims priority, application Japan, May 1, 1981, 56-64849[U]; Jul. 28, 1981, 56-112717[U]; Jul. 29, 1981, 56-113153[U]
Int. Cl.³ B28D 1/18
U.S. Cl. 125—4 9 Claims



1. In a power cutting tool having a drive motor, a housing mechanically connected to the front end of said drive motor, a vertical spindle rotatably supported by and within said housing, said spindle being rotated by said drive motor, a rotary cutter fixed at the lower end of said spindle and adapted to cut a work surface, and a substantially cylindrical cover mounted to said housing and adjustable for the vertical position thereof, said cover encircling said rotary cutter, the improvement comprising:

(a) a plate-like base holder having a forward end pivotally connected to both sides of said housing for angular adjustment relative to said housing and having on the rear portion thereof a bottom slidable on the work surface;

(b) a plate-like roll holder having at the front end thereof a guide roller effective to roll on the work surface and having a rear end pivotally connected to both sides of said housing for angular adjustment relative to said housing; and

(c) a fan mounted to said spindle above said rotary cutter and within said housing.

4,462,382

CIRCULAR SAW FOR CUTTING GREEN CONCRETE AND ASPHALT

Frank C. Baron; Kevin F. Baron, and Kraig M. Baron, all of 24540 John Colter Rd., Hidden Hills, Calif. 91302

Filed Jun. 30, 1983, Ser. No. 509,291
Int. Cl.³ B24D 5/06
U.S. Cl. 125—15 6 Claims

1. In combination:

a circular core having a plurality of spaced slots extending inwardly from its periphery,

each of said slots having a width that is a large fraction of its depth,

said core being adapted to have cutting segments bonded to its periphery and extending between adjacent slots;

respective bar inserts of wear resistant material in respective slots,

the upper end of each insert extending outwardly from the periphery of said core, the inner end of each insert extending into said core substantially below the bottom of the associated slot so as to interlock in face-to-face contact with said core, and each insert having an outer face extending along a negative hook angle with reference to the intended direction of rotation of said core,

the opposite face of each insert being in face-to-face contact with said core, and each insert being bonded to said core throughout its face-to-face contacts with said core.

4,462,383

IMPINGEMENT FOOD PREPARATION APPARATUS

Mitchell C. Henke; Gordon D. Bell, both of Fort Wayne, Ind.; Donald P. Smith, Dallas, and Virgil L. Archer, Irving, both of Tex., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Jun. 9, 1982, Ser. No. 386,609
Int. Cl.³ A21B 1/00
U.S. Cl. 126—21 A 17 Claims

1. An impingement food preparation apparatus comprising:

an enclosure defining a chamber for receiving a food product therein,

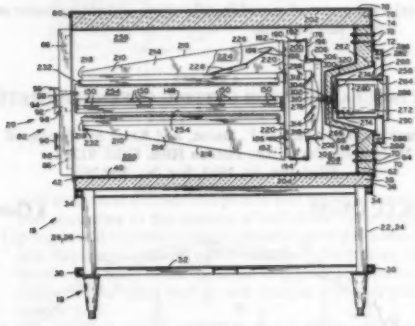
means for supporting a food product within the chamber,

a plurality of duct means mounted within said chamber and

spaced apart from said means for supporting a food product and including a plurality of nozzles therein spaced and positioned to form a plurality of streams of air for impingement on the food product on said means for supporting,

a plenum disposed within said enclosure and connected to said duct means to provide air to said duct means, said plenum having a front portion with a plurality of openings therein connected to said duct means and having a rear wall with a rear opening therein,

a cylindrical collar connected to the rear wall of said plenum and positioned around said rear opening, said collar having a front edge which terminates substantially flush with said rear wall, said collar extending rearwardly beyond said plenum,



impeller means positioned within said collar for drawing air from said chamber into said plenum through said collar, said impeller having a domed hub member and a plurality of blades that are oriented at a given angle of pitch, said blades being connected to said domed hub member,

said collar having a length which is from about 50% to 100% of the pitch length of the blades in the axial direction, and at least one-half of the pitch length of the blades in the axial direction is disposed within said collar,

a shroud having a surface that tapers radially outwardly in a direction away from said impeller, and which is in close proximity to and at least partially rearwardly of said collar for directing air into said collar, and

means in said enclosure for one of heating and cooling the air before it is drawn into said plenum through said rear opening.

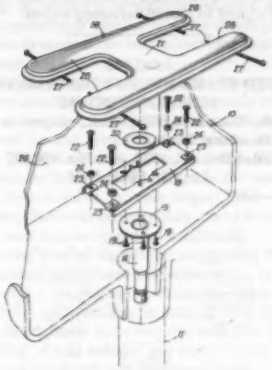
4,462,384

UNIVERSAL ADJUSTABLE REPLACEMENT GAS BURNER

Robert J. Hitch, Columbus, Ga., assignor to W. C. Bradley Enterprises, Inc., Columbus, Ga.

Filed Aug. 29, 1983, Ser. No. 527,080
Int. Cl.³ F24C *3/00*
U.S. Cl. 126—41 R **11 Claims**

1. A universal adjustable replacement gas burner element for a gas fired cooking grill having a body portion including a floor and being supplied with gas through a rising tubular fitting, said burner element being shaped to span a cooking grill body portion substantially for its length and width when placed therein, an adapter plate for the replacement burner element below it, means securing the adapter plate to the replacement burner element and to said tubular fitting, and vertical axis height adjusting and stabilizing screws for the replacement burner element threadedly engaged with the



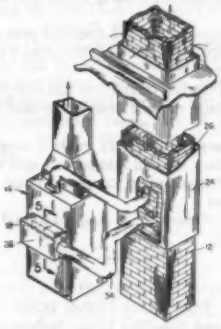
adapter plate and bearing on the floor of the cooking grill body portion.

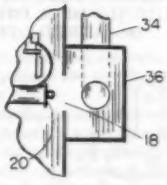
4,462,385

GAS FURNACE ENERGY SAVER

Edward S. Dragon, 6234 S. 38th, Omaha, Nebr. 68107

Filed Feb. 17, 1983, Ser. No. 467,321
Int. Cl.³ F24H *3/00*
U.S. Cl. 126—112 **2 Claims**





1. In combination,

a gas furnace for a building including a cabinet having a burner assembly, exchanger and flue provided therein,

said cabinet having a combustion air intake opening formed therein which communicates with the burner assembly to provide combustion air therefor,

said flue being in communication with a chimney means extending upwardly from the building,

an enclosure extending around at least a portion of the length of said chimney means and being spaced therefrom to define an air passageway,

said enclosure having an inlet opening so that said air passageway is in operative communication with the atmosphere outside of the building,

an enclosure means mounted on said cabinet closing said combustion air intake opening and defining a pre-ignition chamber in communication with said burner assembly,

connection means connecting said air passageway to said enclosure means and said pre-ignition chamber whereby combustion air for said burner assembly will be passed downwardly, from the outside atmosphere, through said air passageway and said pre-ignition chamber to said burner assembly,

said combustion air being heated by said chimney means as it passes downwardly through said air passageway to said burner assembly,

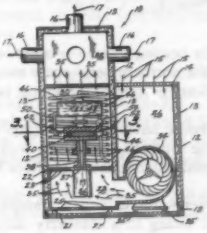
said connection means and said air passageway means substantially preventing air in the interior of the building from being supplied to said burner assembly.

4,462,386

HYDRAULIC FRICTION HEATER

Louis D. Powell, 3312 Melanie Dr., Des Moines, Iowa 50322

Filed Jun. 17, 1983, Ser. No. 505,389
Int. Cl.³ F24C *9/00*
U.S. Cl. 126—247 **10 Claims**



1. A hydraulic friction heater comprising:

a frame;

a heat chamber supported by said frame;

a pump mounted on said frame, said pump including a suction port and a discharge port;

means for driving said pump;

tubing disposed within said heat chamber and having one end disposed in fluid communication with said discharge port and a second end disposed in fluid communication with said suction port, whereby hydraulic fluid is circulated through said tubing by said pump and the frictional resistance of said hydraulic fluid circulating through said tubing generates usable heat energy;

a hydraulic fluid reservoir disposed in fluid communication between said second end of said tubing and said suction port; and

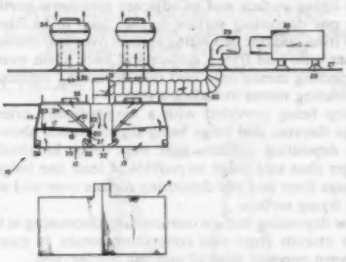
a by-pass line disposed in fluid communication between said discharge port and said hydraulic fluid reservoir, said by-pass line including a temperature actuated control valve, said valve being biased in an open position and disposed to move to a closed position when the temperature of said hydraulic fluid exceeds a predetermined level to increase the flow through said tubing.

4,462,387

KITCHEN EXHAUST APPARATUS

Clarke T. Welsh, Logansport, Ind., assignor to Logansport Distributors, Inc., Logansport, Ind.

Continuation of Ser. No. 194,663, Oct. 6, 1980, abandoned. This application Nov. 26, 1982, Ser. No. 444,663
Int. Cl.³ F24C *15/20*
U.S. Cl. 126—299 R **8 Claims**



1. A kitchen exhaust apparatus which comprises:

an enclosure having a bottom opening:

a substantially flat plate having opposed sides and opposed ends, said plate being sized smaller than the bottom opening of said enclosure;

mounting means for removably mounting said plate to said enclosure to cover only a portion of the bottom opening, said mounting means comprising a rim extending about at least a portion of the bottom opening, the opposed sides of said plate resting upon the rim, said enclosure and said plate defining an exhaust opening between a portion of said enclosure and an end of said plate, the end of said plate which defines the exhaust opening being unsupported by said enclosure, said mounting means further being for positioning said plate with the end being at different distances from the portion of said enclosure to provide an exhaust opening of different sizes;

filter means within said enclosure for filtering air moved through said enclosure, said filter means including a filter having a through-flow area substantially larger than the exhaust opening;

air inlet means for directing air from outside of said enclosure to the exhaust opening; and

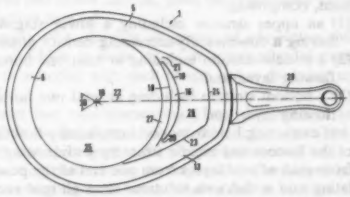
air exhaust means for directing air from the exhaust opening through said filter means and out of said enclosure.

4,462,388

FRYING PAN

Rainer Bohl, Schondorf, and Dorothee Hiller, Stuttgart, both of Fed. Rep. of Germany, assignors to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany

Filed Jun. 7, 1982, Ser. No. 385,726
Int. Cl.³ A47J *27/00*
U.S. Cl. 126—390 **5 Claims**



1. A frying pan comprising:

an upward-facing pan border surrounding a pan bottom to define a pan body;

said pan bottom including an upper side to provide a frying surface, and a bottom side to provide a stand surface;

at least one depositing surface disposed inside said pan border adjacent to said pan border, said one depositing surface having a smaller surface area than said frying surface;

said one depositing surface being raised with respect to said frying surface and being spaced, in plan view, outside of said stand surface;

said one depositing surface being inclined downwardly a few angular degrees towards said pan bottom;

connecting means disposed between a peripheral portion of said frying surface and an adjacent peripheral portion of said one depositing surface so that food to be fried can pass from said one depositing surface over said connecting means onto said frying surface and back again over said connecting means onto said one depositing surface, said connecting means including a step;

said step being provided with a longitudinally extending bulge thereon, said bulge being slightly raised above said one depositing surface, said step being longitudinally longer than said bulge to provide at least one bulge-free passage from said one depositing surface over said step to said frying surface;

said one depositing surface continuously decreasing in width as it extends from said connecting means as measured between opposite sides of said pan border; and

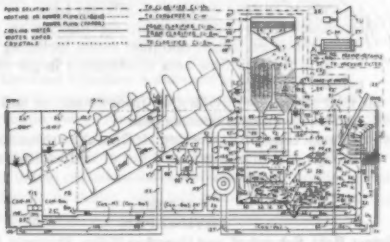
said one depositing surface being supported by and in juxtaposition with a portion of said pan bottom which is raised with respect to said stand surface.

4,462,389

METHOD OF TRAPPING AND UTILIZING SOLAR HEAT

Asriel Usdor, 36 Zirelson St., Tel-Aviv, Israel

Continuation of Ser. No. 408,055, Aug. 13, 1982, abandoned, which is a continuation of Ser. No. 106,360, Dec. 21, 1979, abandoned. This application Aug. 11, 1983, Ser. No. 522,550
Claims priority, application Israel, May 15, 1979, 57291
Int. Cl.³ F24S 3/02
U.S. Cl. 126—415 **15 Claims**



1. A method of establishing and operating a solar pond of an aqueous solution having a downwardly-increasing density, concentration and temperature gradient, characterized in:

A. forming the pond with at least three vertically spaced, horizontal strata of predetermined masses and concentrations, comprising:

(1) an upper stratum including a lower stagnant layer having a downwardly-increasing density gradient;

(2) a middle stratum including at least one horizontally-flowing layer; and

(3) a bottom stratum including at least one horizontally-flowing layer; and

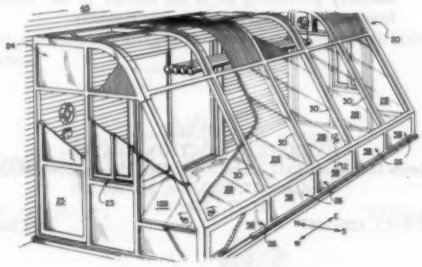
B. and extracting heat from said horizontally-flowing layers of the bottom and middle strata by withdrawing solution from each of said layers from one end of the pond, circulating said withdrawn solutions through heat-exchangers to cool same, re-establishing from the cooled solution the predetermined masses and concentrations of the respective withdrawn solution, and directing same to their respective levels at the other end of the pond, sufficient heat being extracted from the withdrawn solution of the middle stratum to cool same to a predetermined saturation temperature; the solute excess resulting from the mixing between at least a part of the middle stratum and parts of the more concentrated stratum being crystallized by said cooling, settling to the bottom of the pond, and being redissolved in the bottom stratum.

4,462,390

MODULAR SOLAR GREENHOUSE WITH ELEVATED OVERHEAD HEAT STORAGE MATERIAL AND MOVABLE INSULATION BARRIERS AND METHOD AND SYSTEM FOR SOLAR HEATING OF ATTACHED LIVING SPACE USING THERMOSTAT-CONTROLLED AIR CIRCULATION FOR HARVESTING HEAT

Robert B. Holdridge, P.O. Box 167, Silver St.; Douglas C. Taff, P.O. Box 85, both of Hinesburg, Vt. 05461, and William F. Yanda, 460 S. Prospect St., Burlington, Vt. 05401

Filed Oct. 16, 1981, Ser. No. 312,114
Int. Cl.³ F24J 3/02
U.S. Cl. 126—430 **22 Claims**



1. A system for heating a home or other building containing living space in the northern hemisphere using solar energy to provide a significant portion of the annual heating effect comprising:

a solar greenhouse having a top portion adapted to be attached to the southerly facing side wall of a building at a predetermined distance above the floor level of the greenhouse,

said solar greenhouse having a transparent eave region adapted for facing in a southerly direction for sloping downwardly and outwardly in a direction away from the building,

said transparent eave region being multiple glazed,

a plurality of mullions extending downwardly in a southerly direction from said eave region for sloping downwardly and outwardly away from the building at an angle in the range from 50° to 70° to the horizontal, being a steeper slope than the average slope of said eve region,

at least one multiple-glazing transparent window mounted between and being supported by a pair of said mullions, said window sloping downwardly and outwardly in a southerly direction at the same angle as said mullions, said multiple glazing window facing in a southerly direction,

said multiple glazing of the eave region plus said multiple glazing of the window having an average "U" factor of no more than 0.56 Btu per square foot, per hour, per °F. difference between the inside and outside temperature,

said solar greenhouse having a front vertical region forming a kneewall below said window,

said front vertical region extending down from the bottom of said window to the floor level and having thermal insulation at least equal to one inch of insulating foam,

said solar greenhouse containing thermal storage mass in addition to the structural components of the greenhouse, said thermal storage mass providing a storage capability

per square foot of southerly facing transparent glazing material in the range from 18 to 45 Btu of heat capacity per average degree F. temperature change of the storage mass,

said thermal storage mass being supported in said solar greenhouse at an elevation above reasonable headroom level and being positioned for solar radiation to impinge thereon during the normal heating season for said building,

the northerly side of said solar greenhouse being adapted to be defined by said southerly facing side wall of the building,

said northerly side having an opening therein at an elevated location for providing communication at said elevated location between the interior of said greenhouse structure and said living space for circulating solar energy heated warm air from the interior of said solar greenhouse into said living space,

said northerly side having provision for return circulation of air from the living space into the interior of said solar greenhouse near the floor,

fan means for producing said circulation,

control means for controlling the operation of said fan means,

said control means including first and second sensing means,

said first sensing means being positioned within said living space at a location for providing sensing of air temperature representative of the actual air temperature in said living space,

said second sensing means being positioned at an elevated location in the interior of said solar greenhouse and being responsive to the air temperature at said elevated location,

said control means actuating said fan means whenever the air temperature in the interior of the solar greenhouse at said elevated location exceeds a predetermined differential in temperature above the actual temperature of the air being sensed by said first sensing means for harvesting useful solar energy heated air from said solar greenhouse into said living space.

4,462,391

RADIATION RECEIVER

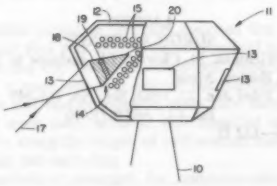
Friedrich Laussermair, Krailling, and Michael Simon, Munich, both of Fed. Rep. of Germany, assignors to M.A.N Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Del.X

Filed Mar. 19, 1981, Ser. No. 245,439

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010882

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—432 **8 Claims**



1. A radiation receiver including a hollow body having an opening for the inlet of radiation; a ceramic absorber arranged within the hollow body for absorbing the radiant energy received through the opening and delivering the energy by radiation to a heat carrier fluid medium, at temperatures of about 1000° C., carried by conduits in the hollow body which are arranged to be radiated by the radiant energy, and said ceramic absorber on the side thereof facing towards the sun rays being constituted of a first ceramic material having low radiation emission and high radiation absorption values and on the side of the absorber facing towards the heat carrier medium being constituted of a second ceramic material having high radiation emission and low radiation absorpton values, such that said second ceramic material radiates a maximum amount of thermal radiation onto the conduits and into the fluid medium.

4,462,392

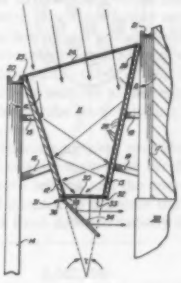
FIXED SOLAR COLLECTION SYSTEM

Harry R. Tipton, 4700 E. Main, Space 625, Mesa, Ariz. 85205

Filed Jun. 23, 1983, Ser. No. 507,238

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—439 **19 Claims**



1. A solar energy collection system for receiving energy from the sun and directing it to a heat-needy appliance, said system comprising: a fixed base; a first and second panel secured to said base and disposed in angular spaced relationship to each other to define an entrance aperture and a exit aperture therebetween; a lens disposed in said exit aperture; a plurality of convex reflectors disposed upon each of said panels for receiving radiant solar energy thereupon and coacting with each other to reflect an effective amount thereof to and through said exit aperture and said lens; and adjustable reflection means disposed in operative spaced relationship to said exit aperture to receive the energy passed through said aperture and said lens and deliver said energy to said heat-needy appliance.

4,462,393

MANUAL MASSAGE INSTRUMENT

Jean-Louis H. Guert, Paris, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 194,492, Oct. 6, 1982, Pat. No. 4,409,967. This application Sep. 27, 1982, Ser. No. 424,391

Claims priority, application France, Oct. 23, 1979, 79 26255

Int. Cl.³ A61H *7/00*

U.S. Cl. 128—62 R **10 Claims**

1. A massage appliance for the skin, comprising:

(a) at least one active face (a), there being provided on each said active face (a)

(b) an array of a plurality of groups of projecting spikes, each of which is made up of an elastically-deformable, flexible material; with each of said spikes (b) being made up of

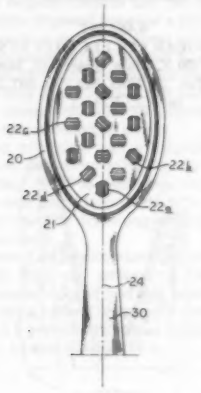
(c) at least two non-intersecting plates displaced so as to uprightly-extend from each of said active faces (a) on which said spike groups (b) are provided, with said non-intersecting plates being so disposed and arranged in respective angular orientation relative one to another as to be at least substantially parallel and spaced apart in side-by-side relationship; and with

each of said respective spike groups (b) provided in said array on each said active face (a) being disposed relative to one another in relative spaced alignment and in a ran-

domly alternating aligned arrangement one relative to the next with

alternate spikes in said spike groups (b) having differing orientation angulations in their given non-intersecting plates (c) therein, so that

the plates (c) of the spike in said spike groups (b) which are



in any given same group are oriented angularly with respect to the plates (c) of the spikes of another given same spike group in the said spike groups array (b) and are arranged such that the spikes of said given same group randomly alternate on each active face (a) on which they are provided with said spikes of said other given same spike group or groups.

4,462,394

INTRAMEDULLARY CANAL SEAL FOR CEMENT PRESSURIZATION

Carl H. Jacobs, New London, Conn., assignor to Howmedica, Inc., New York, N.Y.

Filed May 3, 1982, Ser. No. 374,533
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 C 9 Claims

1. A method for inserting bone cement through the open proximal end of a prepared intramedullary canal of a bone and into said canal, and pressurizing said cement therein, prior to the cementation of a surgical implant within said canal, said method comprising the steps of

(a) providing a bone cement extruder having a nozzle;

(b) providing a cannula comprising a hollow tube having a distal end and a proximal end, an inflatable cuff surrounding at least a portion of said tube, and means to inflate said cuff, with said tube being adapted to receive said nozzle in sliding fit;

(c) sliding said tube over said nozzle so that said cannula is held by said extruder;

(d) inserting said nozzle and said cannula through said open end into said intramedullary canal;

(e) inflating said inflatable cuff so that it forms a seal against the wall of said canal; and

(f) applying bone cement through said nozzle into said canal until said cement becomes pressurized,

whereby escape of cement through the open end of said intramedullary canal is prevented by said seal.

4,462,395

ARTHROSCOPIC LIGAMENTOUS AND CAPSULAR FIXATION SYSTEM

Lanny L. Johnson, 3800 S. Hagadorn Rd., Okemos, Mich. 48864

Filed Mar. 2, 1983, Ser. No. 471,336
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 B 10 Claims

1. An arthroscopic ligamentous and capsular fixation system, comprising:

a substantially cylindrical cannula having a hollowed interior and provided with a threaded portion at one end thereof;

a driver-extractor device, said device including:

(a) a first portion dimensioned to be received within the hollowed interior of said cannula and having a length greater than that of the cannula;

(b) a second portion axially aligned with the first portion and having stop elements at its ends;

(c) a movable member slidable along said second portion between said stop elements; and

(d) a threaded portion located at an end of said first portion adjacent one of said stop elements, said threaded portion being dimensioned to cooperate with the threaded portion of the cannula to thereby permit the cannula to be selectively secured in fixed relationship to the driver-extractor device;

a surgical staple having a generally circular cross-section dimensioned to permit said staple to be received within, and to be slidable along, the hollowed interior of the cannula; and

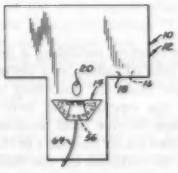
means for removably securing said staple to the first portion of the driver-extractor device at the end thereof opposite that at which the threaded portion is located.

4,462,396

SURGICAL DRAPE

Cynthia A. Wichman, St. Charles, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jan. 27, 1983, Ser. No. 461,349
Int. Cl.³ A61B 19/06
U.S. Cl. 128—132 D 10 Claims



1. A surgical drape, comprising:

a main sheet of flexible material having an inner surface for

facing a patient after placement of the drape, an outer surface for facing away from the patient after placement of the drape, and a fenestration;

a pocket comprising a secondary sheet of flexible material having a pair of end edges, a pair of side edges connecting the end edges, a first surface, and an opposing second surface, said secondary sheet having a first fold line extending between said end edges at a location between said side edges and defining a pair of first and second panels extending between said first fold line and said side edges, with the first surface of said first and second panels facing each other in the folded sheet, said first and second panels having second and third fold lines defining a pair of opposed first and second flaps and a central portion extending between the flaps, said second and third fold lines extending from the juncture of the end and side edges to the first fold line at a location spaced from the end edges, said flaps being folded against the first panel, said central portion defining a cavity communicating with an opening defined by said side edges;

means for securing the flaps to said central portion; and

means for securing the pocket to the outer surface of the main sheet with said opening facing toward the expected path of fluid run-off from said fenestration.

4,462,397

BREATHING CIRCUIT

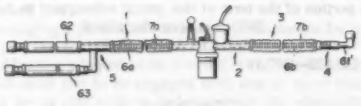
Tatsuo Suzuki, Yokohama, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Apr. 1, 1982, Ser. No. 364,204

Claims priority, application Japan, Apr. 3, 1981, 56-49278; May 18, 1981, 56-71676[U]

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.14 **22 Claims**



1. A breathing circuit, comprising:

A. a coaxial main tube of given length having a patient side end and a ventilator side end, said main tube comprising first and second flexible inner tube sections for forming an inhalation path, and first and second corrugated outer tube sections disposed outside and coaxial with corresponding ones of said inner tube sections for defining an exhalation path between the inner peripheries of said outer tube sections and the outer peripheries of said inner tube sections;

B. a manifold including coaxially disposed first and second inner and first and second outer manifold tube sections each having opposite ends connected, respectively, to an end of a corresponding one of said flexible inner tube sections and said corrugated outer tube sections of said coaxial main tube, wherein said manifold is positioned medially along the length of said coaxial main tube, said manifold also including

(b) a nebulizer arranged for communication with the interior of said first and said second inner manifold tube sections and wherein a part of said nebulizer closes confronting ends of said first and said second outer manifold tube sections in the axial direction of said coaxial main tube,

(b) a tubular bypass interconnecting said exhalation path between said first and said second outer manifold tube tube sections, and

(c) exhalation valve means provided in the path of the bypass for closing the bypass path during an inhalation through said inhalation path, wherein the exhalation valve means comprises an inner cylinder having one end connected to and fluidically communicating with an end portion of one of said first and said second outer manifold tube sections in the region of the end of the outer manifold tube section which is closed by the nebulizer part, an outer cylinder formed coaxially with said inner cylinder and having one end connected to said outer manifold tube section to form a space bound by the inner wall of the outer cylinder, the outer wall of the inner cylinder and the outer manifold tube section for receiving an exhalation from said end portion of the outer manifold tube sections, said inner cylinder having an opposite end defining a valve seat, said outer cylinder having an opposite end provided with valve closure means adapted to cooperate with said valve seat to control exhalation flow from within said inner cylinder into said space, said bypass including conduit means for fluidically communicating said space with the interior of an end portion of the other of said first and second outer manifold tube sections in the region of the end of the manifold outer tube section which is closed by the nebulizer part, and

C. an inner tube retaining member provided at the patient side end of said coaxial main tube for fixing the corresponding inner tube section and the corresponding outer tube section and adapted to maintain the inner and outer tube sections at a fixed distance radially from each other.

4,462,398

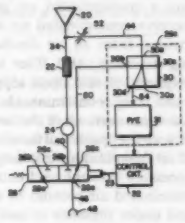
RESPIRATING GAS SUPPLY METHOD AND APPARATUS THEREFOR

Gerald Durkan, Altoona, Pa., and Leonard M. Sieracki, Columbia, Md., assignors to Kircaldie, Randall and McNab, Wethersfield, Conn., as trustee

Filed Dec. 3, 1982, Ser. No. 446,542

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.14 **11 Claims**



1. An apparatus for sensing negative pressure in an in vivo respiratory system and for supplying gas to said in vivo respiratory system, said apparatus comprising:

valve means having first, second and third ports, said first port being selectively communicable with either said second port or said third port;

a single line connected to said first port of said valve means, said line adapted both to transmit to said valve means negative pressure indicative of an inspiration in said in vivo respiratory system and to transmit gas to said in vivo respiratory system;

a source of gas communicating with said second port of said valve means;

means for sensing negative pressure in said in vivo respiratory system, said sensing means communicating with said third port of said valve means; and,

means for controlling said valve means, said control means being responsive to said sensing means for selectively connecting said first port of said valve means to said second port thereof when negative pressure is sensed and for maintaining said connection for at least a portion of the time duration of said negative pressure in said in vivo respiratory system so that gas may be supplied to said in

vivo respiratory system, said control means also being adapted to reconnect said first port of said valve means to said third port thereof after the application of gas to said in vivo respirating system.

4,462,399

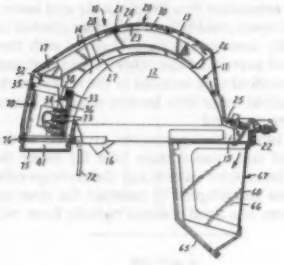
POWERED AIR RESPIRATOR AND CARTRIDGE

David L. Braun, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 2, 1981, Ser. No. 307,872

Int. Cl.³ A61F 9/06; A61M 15/00

U.S. Cl. 128—201.25 **16 Claims**



1. A high efficiency rigid or semi-rigid air filter cartridge for use in the helmet of a powered air respirator, said air filter cartridge comprising:

a lightweight, hollow frame having a closed bottom which is curved, side walls, an open top, and having filter media mounted across the top of said frame constituting the upper surface of said cartridge, said frame and said filter media forming a contaminated air plenum having one entrance to receive contaminated air into one end of said air filter cartridge from an air discharge port of a fan motor housing assembly, said filter media being sealed about the periphery of said open topped frame to close said frame, and said contaminated air plenum being bounded by the inner surfaces of the bottom and side walls of said frame and the inside surface of said filter media, contaminated air from said air discharge port being channeled under pressure through said entrance to said frame and said contaminated air plenum of said filter cartridge and distributed under pressure to and through said contaminated air plenum and said filter media to provide purified air.

8. A high efficiency powered air respirator for providing filter air to a wearer, said respirator comprising:

(a) a hardhat and an overlying shell member secured to said hardhat and spaced therefrom to form a dome-shaped cavity between said hardhat and said shell member,

(b) a face shield assembly hingeably attached to and depending from the front of said shell member,

(c) air circulating means including a fan motor housing with an air discharge port at one end thereof, said air circulating means located in the rear portion of said dome-shaped cavity,

(d) a rigid or semi-rigid, disposable, high efficiency, air filter cartridge located in said dome-shaped cavity, said air filter cartridge comprising:

a lightweight, hollow frame having a closed bottom which is curved, side walls, an open top, and having filter media mounted across the top of said frame,

said frame and said filter media forming a contaminated air plenum having one entrance to receive contaminated air into one end of said air filter cartridge from an air discharge port of a fan motor housing assembly,

said filter media being sealed about the periphery of said open topped frame to close said frame, and

said contaminated air plenum being bounded by the inner surfaces of the bottom and side walls of said frame and the inside surface of said filter media, contaminated air from said air discharge port being channeled under pressure through said entrance to said frame and said contaminated air plenum of said filter cartridge and distributed under pressure to and through said contaminated air plenum and said filter media to provide purified air, and

(e) a clean air passageway comprising the remaining space in said dome-shaped cavity, said air discharge port of said fan motor housing providing contaminated air under pressure from said air circulating means into said contaminated air plenum entrance and through said contaminated air plenum and into and through said filter media to deliver purified air to said clean air passageway, said clean air passageway having openings at one end for delivering purified air to said face shield assembly thereby providing clean air in a stream over the wearer's face.

4,462,400

SWIMMING APPARATUS

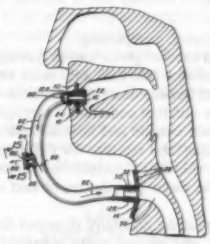
Elliot Simons, 51 Broad Reach, #M-53A, and Robert Boulos, 51 Broad Reach, #T-64A, both of North Weymouth, Mass. 02191

Continuation-in-part of Ser. No. 267,690, May 28, 1981, Pat. No. 4,401,118. This application May 16, 1983, Ser. No. 494,710

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.³ A61M 16/00

U.S. Cl. 128—207.16 **16 Claims**



1. A swimming apparatus used to enable a person having a laryngectomy or the like to safely swim, said apparatus comprising; a elongated air tube, a mouthpiece means at one end of the air tube having an air passage communicating with the air tube to enable air passage between the air tube and the person's mouth, a relatively flat sealing member having means forming a water tight seal about the throat stoma, said sealing member also having an air message, means securing the other end of the air tube to the sealing member enabling air passage between the air tube and the person's throat, means holding the sealing member in water tight sealing relationship to the throat about the throat stoma, first valve means at the mouthpiece end of the air tube and operable during inhalation to permit air flow through the air tube to the throat stoma, and a second valve means disposed along the air tube and operable during exhalation for permitting air flow from the throat stoma therethrough.

4,462,401

METHOD AND ANCHOR FOR ANCHORING ELECTRODE LEADS USED IN COCHLEAR IMPLANTATION

Paul A. Burgio, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 15, 1982, Ser. No. 441,938
Int. Cl.³ A61F 11/00; A61N 1/60
U.S. Cl. 128—303 R 6 Claims

1. In the method of implanting one or more electrodes in or adjacent to a human cochlea so that the electrode can afford electrical stimulation of nerve fibers to produce the sensation of sound, which method comprises the step of positioning a lead terminating at the electrode through an opening surgically made in a temporal bone with the electrode at a predetermined position relative to the cochlea, the improvement wherein said method further includes the steps of:

(a) providing an anchor having a first end portion and a second end portion comprising means for engaging a portion of the lead to restrict longitudinal, transverse and rotational movement thereof relative to the anchor;

(b) forming a socket from the opening into the temporal bone, which socket is adapted to receive the first end portion of the anchor;

(c) inserting the first end portion of the anchor into the socket; and

(d) engaging a portion of the lead with the means for engaging of the anchor.

3. An anchor adapted to be inserted in the temporal bone of a human skull and to be engaged with one or more leads extending to an electrode to help position the electrode at a desired location relative to the cochlea, said anchor comprising a first end portion comprising means for engaging the temporal bone, and an opposite generally U-shaped second end portion having adjacent surfaces and a distal tip as a means for projecting from a temporal bone engaged by said means for engaging so that the combined space between said means for engaging the temporal bone and said distal tip and between said adjacent surfaces is generally L-shaped and is adapted to receive a portion of a said lead therein.

4,462,402

METHOD AND ANCHOR FOR ANCHORING

Paul A. Burgio, Roseville, Minn.; Derrick A. Jones, Houlton, Wis., and Allen J. Abel, Roseville, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 15, 1982, Ser. No. 441,944
Int. Cl.³ A61N 1/04; A61F 11/00
U.S. Cl. 128—303 R 4 Claims

1. In the method of implanting one or more electrodes in or adjacent to a human cochlea so that the electrode can afford electrical stimulation of nerve fibers to produce the sensation of sound, which method comprises the step of positioning a lead terminating at the electrode through an opening surgically made in a temporal bone with the electrode at a predetermined position relative to the cochlea, the improvement wherein said method further includes the steps of:

(a) providing an anchor having a first end portion and a second end portion comprising means for engaging a portion of the lead to restrict longitudinal, transverse and rotational movement thereof relative to the anchor, the first end portion of the anchor including a barb projecting along one side and toward the second portion of the anchor;

(b) forming a socket from the opening into the temporal bone, which socket is adapted to receive the first end portion of the anchor;

(c) inserting the first end portion of the anchor into the socket with the anchor rotated from its desired orientation;

(d) rotating the anchor to its desired orientation; and

(e) engaging a portion of the lead with the means for engaging of the anchor.

2. An anchor adapted to be inserted in the temporal bone of a human skull and to be engaged with one or more leads extending to an electrode to help position the electrode at a desired location relative to the cochlea, said anchor comprising

a metal wire having a first end portion of a size capable of insertion in a socket in the temporal bone and comprising means adapted to firmly engage the walls defining the socket; and an opposite generally U-shaped second end portion having adjacent surfaces; and

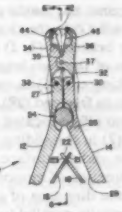
a layer of resiliently elastic polymeric material over the adjacent surfaces of said wire along said U-shaped end portion and having adjacent surfaces, the adjacent surfaces of said layer of polymeric material being spaced to frictionally receive a portion of a said lead therebetween.

4,462,403

SINGLE ACTION FORCEPS FOR BONE SURGERY

Werner Martin, Rietheim, Fed. Rep. of Germany, assignor to Vernitron Corporation, Lake Success, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,839
Int. Cl.³ A61B 17/16
U.S. Cl. 128—312 6 Claims



1. An instrument for holding and chipping a bone, comprising:

a pair of flat, elongated, curved handles, arranged in coplanar disposition, and having outer free ends normally spaced widely apart and other ends normally abutted to each other;

a spring means normally holding said outer free ends of said handles spaced apart;

a pair of flat, elongated jaws having lower ends abutted to each other in coplanar disposition;

a pivot means rotatably engaging said other ends of said handles respectively to said lower ends of said jaws;

a further pivot means rotatably engaging central portions of said jaws to each other, and holding upper ends of said jaws in outwardly spaced disposition; and

a free floating other pivot means serving as a fulcrum around which said handles rotate between open and closed positions of said instrument, wherein said other pivot means comprises a disk engaged in slots formed in opposing inner edges of said handles and located near said other ends thereof.

4,462,404

FORCEPS- OR TWEEZERS-SHAPED SURGICAL INSTRUMENT

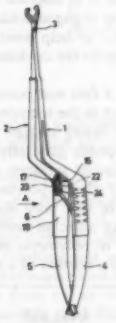
Theodor Schwarz, Tuttlingen; Karl Freyer, Talheim, and Manfred Theilmann, Tuttlingen, all of Fed. Rep. of Germany, assignors to Vormals Jetter & Scheerer Aesculap-Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,747

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103352

Int. Cl.³ A61B *17/28*

U.S. Cl. 128—321 **18 Claims**



1. Forceps- or tweezers-shaped surgical instrument with two branches movable opposite one another against the action of an elastic restoring force and with a lock for fixing the mutual distance between the branches which becomes active during the approach of the two branches and can be released by still further approach, characterized by the fact that a locking arm (6) is fastened to the inside of one branch with its free end (28) resting elastically against the inside of the other branch and sliding along the branch (2) in the closing direction during the approach of the two branches (1, 2) and along its inner wall during the separation of the two branches in the direction of opening, that the locking arm (6) carries a locking element (29) projecting laterally at its free end (28), that a sliding surface (7) for the locking element (29) is located on the inside wall (10) of the opposite branch (2) in the sliding region of the end of the locking arm (28), the sliding surface has a locking step (11) running across the direction of motion of the locking element, and dropping off in the direction of closing, that a guide (19, 22, 23) arranged essentially parallel to the sliding surface (7) is coordinated with the sliding surface and presses the locking element (29) elastically against the sliding surface (7) at least in the region of the locking step (11), that the guide (22, 23) terminates beyond the locking step (11) in the closing direction, so that the locking element (29) reaches in front of the guide (22, 23) upon the further approach of the branches (1, 2), that in the rest position the end (20) of the guide (22, 23) in front of the locking step (11) has a separation from the sliding surface (7) which is smaller than the height of the locking element (29), so that the locking element (29) slides on the guide (22, 23) when moving in the direction of opening by enlarging the separation of the branches, and that the guide (22, 23) terminates beyond the locking step (11) in the opening direction and at that point has a distance from the sliding surface (7) in the rest position that is greater than the height of the locking element (29), so that the locking element (29), when moving in the opening direction after sliding on the guide (22, 23) beyond the locking step (11), springs onto the sliding surface (7) and enters the gap between the sliding surface (7) and the guide (22, 23) in the subsequent motion in the closing direction.

4,462,405

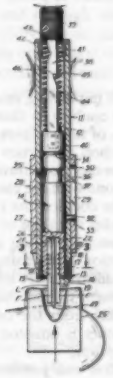
BLOOD LETTING APPARATUS

Joseph C. Ehrlich, 2440 Sedgewick Ave., Bronx, N.Y. 10468

Filed Sep. 27, 1982, Ser. No. 424,045

Int. Cl.³ A61B *17/34, 17/32*

U.S. Cl. 128—329 R **9 Claims**



1. A blood letting apparatus comprising a guide member having an internal bore, a hammer movably mounted in one end of said bore, said hammer being shiftable axially between cocked and fired positions, spring means reacting between said guide member and hammer and urging said hammer toward said fired position, a lancet carrier member movably mounted in said bore adjacent the other end of said guide member, said carrier member being free of connection to and movable independently of said hammer, said carrier member including a chuck portion directed toward said other end of said guide member, a lancet adapted to be frictionally retained in said guide member, stop means on said guide member in the path of said carrier member for limiting outward axial movement of said carrier member relative to said other end, and a tubular collar member axially movably mounted on said guide member, said collar member being shiftable between a retracted loading position and a projected gauging position, said collar member, in said gauging position including a free end portion extending a predetermined distance beyond said other end of said guide member, said lancet, in said gauging position of said collar member, being positioned relative to said free end portion of said collar member to exert a finite pressure against the skin of the patient.

4,462,406

DUAL CHANNEL ISOLATION SYSTEM FOR CARDIAC PACER

Robert DeCote, Jr., Miami Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

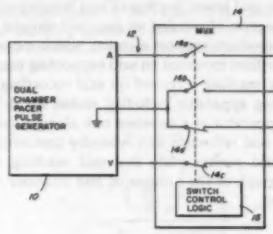
Filed May 5, 1982, Ser. No. 375,039

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **9 Claims**

1. A dual channel cardiac pacing system of the type comprising a three terminal cardiac pacer pulse generator and two bipolar leads, wherein the improvement comprises multiplexor means connected between the leads and the pulse generator for

isolating said leads and further including means for alternately connecting said leads to said pulse generator for equal intervals



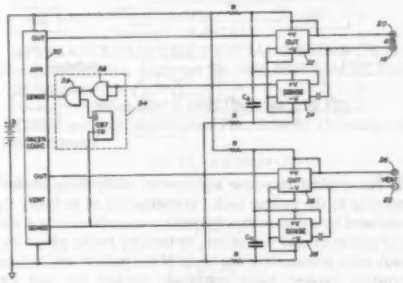
of time at a predetermined fixed rate, having a period less than the P-wave duration and independent of the stimulation rate.

4,462,407

DUAL CHANNEL CARDIAC PACER ISOLATION CIRCUIT

Hari Herscovici, Miami Beach, and Peter P. Tarjan, Miami, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed May 5, 1982, Ser. No. 375,040
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **21 Claims**



1. A cardiac pacer of the type comprising a main power supply, two pacer leads for establishing electrical contact with different parts of the heart, dual channel input/output circuitry including two sense circuits providing logic outputs indicative of electrical activity associated with the respective leads and two stimulation output circuits responsive to logic commands for applying electrical stimulation pulses to the heart via the respective leads and pacing logic circuitry powered by said main power supply for providing logic commands to said stimulation output circuits and connected to receive the outputs of said sense circuits, wherein the improvement comprises:

means for electrically isolating the input/output circuitry including:

(a) first capacitive means for storing electrical energy connected across said input/output circuitry for one channel to supply power thereto;

(b) second capacitive means for storing electrical energy connected across the input/output circuitry for a second channel, and

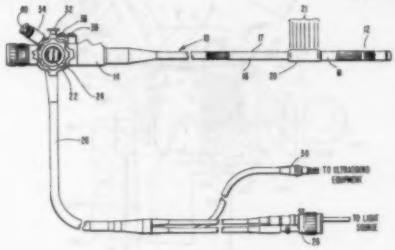
(c) means operatively connected to said main power supply for separately charging said first and second capacitive means and for isolating said input/output circuitry for the two channels from each other and from the main power supply, whereby crosstalk between said pacing leads is reduced.

4,462,408

ULTRASONIC ENDOSCOPE HAVING ELONGATED ARRAY MOUNTED IN MANNER ALLOWING IT TO REMAIN FLEXIBLE

Fred E. Silverstein, Seattle, and David Giuliani, Mercer Island, both of Wash., assignors to Advanced Technology Laboratories, Inc., Bellevue, Wash.

Filed May 17, 1982, Ser. No. 379,213
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **10 Claims**



1. An improved fiber-optic endoscope of the type comprising:

(a) a tube having a bending section which can be bent under operator control, which tube includes a distal end portion which contains light transmitting and receiving means;

(b) a control unit with which an operator can control, through control means, the position of said distal portion;

(c) an intermediate insertion portion of said tube between said distal portion and said control unit; and

(d) an elongated ultrasonic transducer of the type which provides cross-sectional images through a portion of the body, which transducer is mounted on said tube,

wherein the improvement comprises the elongated ultrasonic transducer being mounted on the distal end of said insertion portion of said tube.

4,462,409

PRESSURE TRANSDUCER DOME

Max L. Pace, Deer Park; Fred J. Shipley, Pearland, and Jerald H. Webb, Seabrook, all of Tex., assignors to Healthdyne, Inc., Marietta, Ga.

Filed May 15, 1981, Ser. No. 263,890
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—675 **14 Claims**

1. In a pressure measuring system for detecting pressure in the cardiovascular system of a subject, wherein fluid filled tube means are connected directly to portions of the cardiovascular system to directly interface with the blood supply of the subject and extend therefrom into fluid communication with pressure sensitive means for detecting fluid pressure, means for improving the response characteristics of the pressure measuring system, which means comprise:

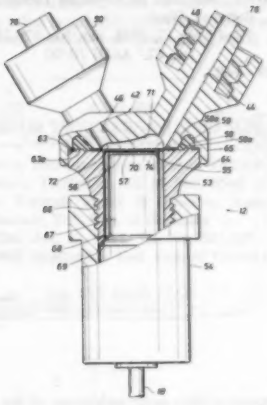
a. housing means including chamber means;

b. deformable material means disposed across said chamber means to divide said housing means into first and second portions, said first portion being arranged for communication with said fluid filled tube means, and said second portion housing said pressure sensitive means; and

c. fluid accumulator means formed in said chamber means in said first housing portion and adjacent said deformable material means wherein the surfaces defining said accumulator means are generally non-parallel, said fluid accumulator means comprising an internal cavity defined by interior surfaces in cooperation with said deformable material means, including a first interior surface generally opposite said deformable material means and peripheral

surfaces between said first surface and said deformable material means, wherein:

i. said first surface and said peripheral surfaces are non-parallel to said deformable material means in its relaxed configuration;



ii. said peripheral surfaces are sloped at varying acute angles relative to said deformable material means in its relaxed configuration, and are mutually non-parallel; and

iii. said first surface further comprises a convex surface portion for dispersing fluid flow within said cavity.

4,462,410

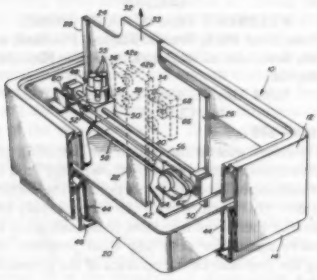
SPIROMETER

Maurice R. Blais, Andover, and Craig N. Hess, Chestnuthill, both of Mass., assignors to LSE Corp., Woburn, Mass.

Filed Jun. 26, 1981, Ser. No. 277,998

Int. Cl.³ A61B 5/08

U.S. Cl. 128—727 **14 Claims**



1. A recording spirometer comprising:

a housing including an upper portion and a lower portion;

a pusher plate having a top side and a bottom side disposed within said housing;

sealing means for creating an airtight seal between said pusher plate and said housing;

a single elongate supporting member affixed to and extending from the top side of said pusher plate;

bearing means supported by said upper portion of said housing and including means for engaging said single supporting member to constrain said supporting member and the affixed pusher plate to substantially linear motion along a reference axis and to substantially eliminate the potential jamming of the pusher plate and to create beneath said bottom side of said pusher plate an airtight chamber whose volume varies with the position of said pusher plate along said axis;

an opening in said lower portion of said housing adapted for the introduction of exhaled air into said airtight chamber;

a recording medium support element which supports a recording medium mounted on said supporting member; and

apparatus for marking a record on said recording medium, said marking apparatus including means for driving said marking apparatus at a constant rate along a axis perpendicular to said reference axis whereby concurrent movement of said pusher plate and said marking apparatus creates a graph of the volume of said chamber as a function of time.

4,462,411

EVOKED RESPONSE AUDIOMETER

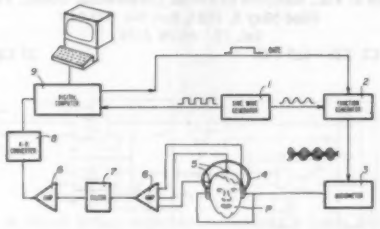
Field W. Rickards, Glen Iris, Australia, assignor to The University of Melbourne, Parkville, Australia

Filed Jan. 6, 1982, Ser. No. 337,397

Claims priority, application Australia, Jan. 7, 1981, PE7169

Int. Cl.³ A61B 5/04

U.S. Cl. 128—746 **10 Claims**



1. An evoked response audiometer comprising means for supplying to the patient under investigation an auditory signal modulated by a continuous frequency waveform over a plurality of cycles of said waveform, to thereby evoke phase-locked steady state potentials in the brain of the patient, and means for recording evoked brain potentials evoked by said signal, whereby phase-locking of said steady state recorded potentials to the modulated auditory signal may be determined characterized in that said auditory signal is presented in a frequency specific continuous modulated form for an extended period of time to evoke phase-locked steady state potentials in the brain.

4,462,412

ANNULAR ELECTROMAGNETIC RADIATION APPLICATOR FOR BIOLOGICAL TISSUE, AND METHOD

Paul F. Turner, North Salt Lake, Utah, assignor to BSD Medical Corporation, Salt Lake City, Utah

Filed Apr. 2, 1980, Ser. No. 136,506

Int. Cl.³ A61N 1/40

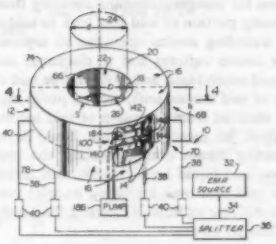
U.S. Cl. 128—804 **15 Claims**

1. An electromagnetic radiation hyperthermia system for causing heating in generally cylindrical biological tissue specimens comprising:

(a) a source of electromagnetic radiation energy having a preselectable radiation frequency, f;

(b) an annular applicator apparatus having a specific characteristic impedance and including radiation input portions and means coupled thereto defining a central, axial opening sized to receive the tissue specimens for irradiation thereof; wherein the central opening defining means also defines a peripheral radiation emitting aperture around and along the opening, wherein the aperture comprises a

plurality of radiating segments, said aperture having an axial height, h, and circumferential length, w, selected for causing impedance matching at said frequency, f, between the applicator apparatus characteristic impedance and a load impedance of the received specimens as presented to the emitting aperture, and wherein the aperture is configured to cause an enhanced heating region within the specimen; and



(c) electromagnetic radiation transmission means for interconnecting said source with the radiation input portions of said applicator apparatus, wherein said transmission means couples energy to each of said radiating segments in a predetermined phase relationship to cause constructive interference in the enhanced heating region.

4,462,413

APPLIANCE FOR THE PARTIAL DYEING OF HAIR

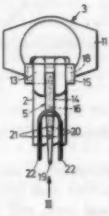
Wolfgang Schmitz, Aachener Str. 609, 5000 Köln 41, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,575

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029691

Int. Cl.³ A45D *24/22*

U.S. Cl. 132—113 **14 Claims**



1. An appliance for the partial dyeing of hair comprising: at least one guide prong (**14, 29**) having a free end (**19**) and an interior dye feed bore (**16**) extending therethrough to said free end (**19**) and at least one dye outlet orifice (**21**) extending laterally through said prong from said feed bore (**16**) to the exterior thereof at a position spaced from said free end (**19**), at least one masking prong (**22**) having a different shape than said guide prong disposed adjacent to and spaced laterally from said outlet orifice in said guide prong for separating and protecting hair outside said masking prong from the guide prong (**14, 29**) for dyeing hair between said guide prong and said masking prong and to prevent the protected hair outside said masking prong from being treated by the dye emitted from the outlet orifice (**21**), and container means supporting said guide prong (**14, 29**) for delivering dye to said feed bore (**16**) of said guide prong for emitting dye from said outlet orifice (**21**), said outlet orifice being defined by a transverse bore (**20**) extending through said guide prong to define one of said outlet orifices (**21**) on each side of said guide prong, and including two of said masking prongs (**22**) disposed on opposite sides of said guide prongs adjacent said outlet orifices.

4,462,414

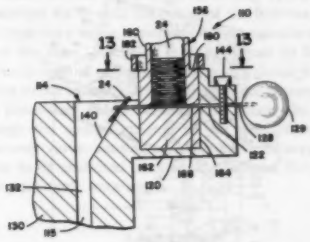
COIN FEEDING DEVICE FOR SLOT MACHINES

George N. Gordon, 203 Missouri St., San Francisco, Calif. 94107

Filed Jun. 16, 1982, Ser. No. 389,025

Int. Cl.³ G07D *1/08*

U.S. Cl. 133—5 B **12 Claims**



1. A device for feeding coins one at a time from a supply of said coins into a slot machine having a coin inlet for receiving said coins one at a time in edge-on position for falling of said coins by gravity into said inlet, said device comprising:

(a) means formed integrally with said coin inlet of said slot machine defining a first passageway of generally rectangular cross-section dimensioned to pass said coins one at a time in edge-on orientation;

(b) means defining a tubular reservoir dimensioned to receive said supply of said coins in face-to-face stacked relationship, the tubular axis of said reservoir extending normally to the major surfaces of said first passageway with one end of said tubular reservoir opening into said first passageway through one of said major surfaces thereof;

(c) means formed integrally with said coin inlet of said slot machine defining a second passageway of generally rectangular cross-section communicating with one end of said first passageway and dimensioned to pass said coins one at a time in edge-on orientation, said second passageway extending transversely of said major surfaces of said first passageway and the end of said second passageway remote from said first passageway communicating with said coin inlet of said slot machine; the junction between said first and second passageways being dimensioned to allow the faces of said coins to pivot by about 90° within said junction, said

(d) a slide member received in the other end of said first passageway for reciprocating motion therewithin, said slide member being of sufficient length to move a coin received in said first passageway from said reservoir into said junction between said first and second passageways.

4,462,415

PARTS CLEANER ADAPTED FOR SIMPLIFIED SERVICE

Karl G. Otzen, Barrington, Ill., assignor to Safety-Kleen Corporation, Elgin, Ill.

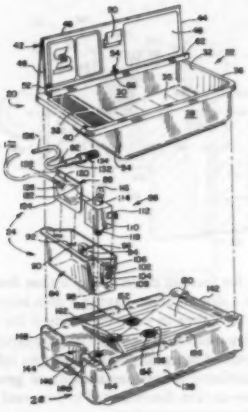
Filed Nov. 15, 1982, Ser. No. 441,640

Int. Cl.³ B08B *3/04*

U.S. Cl. 134—111 **36 Claims**

1. A readily serviceable, storable and transportable parts washer unit comprising, in combination, a storage and transport receptacle for cleaning fluid, a sink portion, and a cleaning fluid circulation system, said receptacle being a closable container having one portion thereof adapted to lie adjacent and be supported by a generally flat working surface and having an

oppositely directed portion contoured so as to receive and locate in nested relation a cooperating portion of said sink, said receptacle further including first and second openings adapted respectively to permit washing fluid to drain into said receptacle and to receive a dip tube portion of said fluid circulating system for permitting withdrawal of said fluid from said receptacle, said sink including side and bottom walls defining a principal portion adapted to receive parts to be washed, and being of at least partially complementary shape with respect to said contoured portion of said receptacle so as to be received



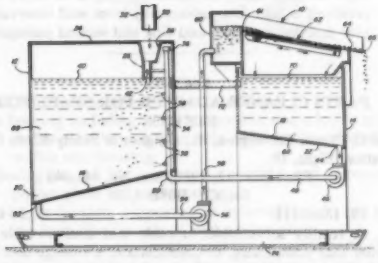
therein in nested relation, a drain opening in said bottom sink wall, said fluid circulating system including a dip tube, and a pump and motor adapted to draw fluid through said dip tube and to direct said fluid toward the parts to be washed, at least one of said sink and said fluid circulating system having means for directing solvent from said pump to a discharge outlet disposable within said sink, and means for releasably interlocking said sink to said container in nested relation and for removably positioning and holding said fluid circulation system such that said dip tube extends into said second receptacle opening.

4,462,416

METHOD AND APPARATUS FOR WASHING DRILLING CUTTINGS

James M. George, New Orleans, and James D. Smith, Patterson, both of La., assignors to Trinol Chemical Corporation, New Orleans, La.

Filed May 6, 1982, Ser. No. 375,951
Int. Cl.³ B08B 3/00
U.S. Cl. 134—104 **4 Claims**



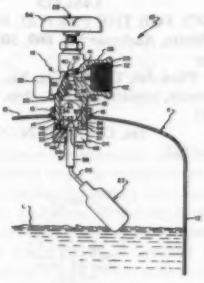
1. An apparatus for washing, cleaning and separating drilling cuttings, said apparatus including separate first and second common elevation cleaning and separating tanks each including a lower sump portion, said tanks having quantities of cleaning fluid therein to a common level, means for discharging a stream flow of cuttings into said first tank, cleaning fluid jet means for causing at least one jet flow of cleaning fluid to laterally impinge upon said stream flow and a plurality of jet flows of cleaning fluid to be generally horizontally discharged in said first at different elevations therein below the cleaning fluid level therein, a foraminated vibratory screen-type separator supported from an upper portion of said second tank, first pump means for pumping cleaning cleaning fluid and cuttings from the sump portion of said first tank to said separator, said separator including means operative to separate liquids and fines from coarse cuttings and to discharge said liquids and fines into said second tank and to discharge said coarse cuttings outwardly of said second tank, second pump means for pumping fluent material from the sump of said second tank to said cleaning fluid jet means, common liquid level maintaining communicating means communicating the interiors of said tanks below said liquid level therein, said means discharging cuttings in said first tank including an inlet conduit laterally into which said one jet flow of cleaning fluid is directed by said cleaning fluid jet means.

4,462,417

VALVE ASSEMBLY

Joseph C. Trinkwalder, Jr., North Tonawanda, N.Y., assignor to Sherwood Selpac Corp., Lockport, N.Y.

Filed Sep. 20, 1982, Ser. No. 419,821
Int. Cl.³ F16K 17/36, 31/18
U.S. Cl. 137—39 **5 Claims**



1. A valve assembly adapted to be mounted on a fuel storage tank, comprising:

a body adapted to be mounted on said tank, said body having an inlet arranged within said tank and having an outlet arranged without said tank, and having an internal passageway communicating said inlet and outlet, said body also having first, second and third valve seats surrounding said passageway;

a flow metering valve operatively mounted on said body and having a member selectively movable toward and away from said first valve seat for controlling the flow of fluid through said passageway;

a valve element mounted in said passageway for movement between said second and third seats, said element being arranged to prevent flow through said passageway from said outlet to said inlet when said element engages said second seat, said element being further arranged to sealingly engage said third seat if a differential between the pressures at said inlet and outlet exceeds a predetermined maximum pressure differential; and

a float mounted on said body and arranged to sense the level of liquid in said tank, said float being operative to hold said element off said second seat when the sensed liquid level is less than a predetermined maximum level, and opposite to permit said element to engage said second seat when the

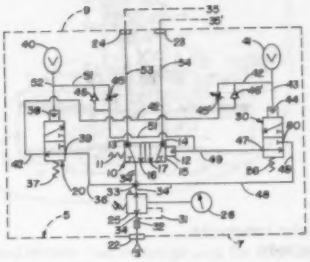
sensed liquid level is greater than said predetermined maximum level.

4,462,418

UNITIZED PNEUMATIC CYCLING AND TIMING SYSTEM

Thomas G. Xander, Corry, Pa., assignor to The Al Xander Co., Inc., Corry, Pa.

Filed Feb. 25, 1982, Ser. No. 352,094
Int. Cl.³ F16K *11/06*
U.S. Cl. 137—106 **3 Claims**



1. A unitized, pneumatic cycling and timing system comprising:

a. a box-shaped housing having opposed top and bottom surfaces and opposed front, rear and side surfaces;

b. an air inlet orifice mounted on a surface of the housing adapted to communicate with an external source of pressurized air;

c. an air pressure regulator positioned within the housing communicating with the air inlet orifice and including an adjustment knob on the exterior of the housing to regulate the pressure of the inlet air;

d. an air pressure gauge associated with the air pressure regulator for visually reading the regulated air pressure on an exterior surface of the housing;

e. first and second single piloted, spring return three-way time delay valves, each having volume chambers and time delay adjustment knobs associated therewith, said first and second valves being mounted within said housing and said time delay adjustment knobs mounted on an exterior surface of said housing;

f. a single piloted, spring return four-way valve mounted within the housing having first and second air outlet ports communicating with a pair of air outlet orifices mounted on an exterior surface of said housing, said outlet orifices adapted to be connected to a remotely located, air actuated work device; and

g. air circuit means positioned within the housing interconnecting the air pressure regulator with said first and second three-way time delay valves and said four-way valve, whereby, when the external air supply is applied, said four-way valve sequentially emits air through the outlet orifices at a predetermined pressure by adjustment of the pressure regulator knob and at a predetermined time and duration by selective rotation of the time delay adjustment knobs of the first and second three-way time delay valves, said air circuit means comprising:

a first air line for passing pressurized inlet air from the pressure regulator to the four-way valve, said four-way valve when in an unshifted position passing said air through its first outlet port and thence through an outlet air line to the first outlet orifice on the exterior of the housing;

a second air line for passing pressurized inlet air from the pressure regulator to the first three-way time delay valve, said first three-way valve when in an unshifted position passing air to the pilot of the second three-way time delay valve;

a third air line for passing pressurized inlet air from the pressure regulator to the second three-way time delay valve which in an unshifted position blocks the air in said third air line; and

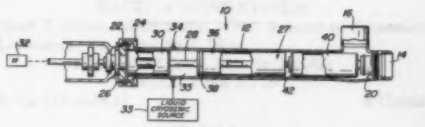
a fourth air line connected to the second three-way time delay valve and adapted to communicate with the third air line when the second three-way valve is shifted, said fourth air line adapted to pass air from the second three-way valve to the pilot of the four-way valve and to the pilot of the first three-way valve, whereby pressurized air in the second air line causes the pilot of the second three-way valve to shift said second three-way valve to permit pressurized air to shfit the pilots of the four-way and the first three-way valve, whereupon the pressurized air output of the four-way valve is shifted from its first outlet port to its second outlet port and passes through an outlet air line to the second outlet orifice on the housing and the first three-way valve is shifted to block the air flow through the second air line to the pilot of the second three-way valve, causing said second three-way valve to return to its unshifted position and exhaust the circuit to begin said cycle once again.

4,462,419

THERMAL BLOCKED VALVE

Steve L. Hensley, Columbus, Ohio, assignor to CVI Incorporated, Columbus, Ohio

Filed May 17, 1982, Ser. No. 378,545
Int. Cl.³ F16K *49/00*
U.S. Cl. 137—340 **10 Claims**



1. A valve for controlling cryogenic fluids in a vacuum enclosed system and having a thermal block comprising a hollow valve housing having an inlet and an outlet, a valve seat in said housing, a valve member positioned in said housing for cooperation with said seat to control flow between the inlet and outlet, means including a stem coupled to said valve member for moving said valve member between an open and closed position, an external source of refrigeration connected to means on the housing for cooling said housing in all positions of said valve member and for cooling said valve member by conduction via said stem when said valve member is in an open position.

4,462,420

SAFETY PRESSURE RELIEF VALVE

Eugene C. Cullie, Tappan, N.Y., assignor to Teledyne Farris Engineering, Palisades Park, N.J.

Filed Jun. 14, 1982, Ser. No. 388,261
Int. Cl.³ F16K *31/122*
U.S. Cl. 137—488 **9 Claims**

1. An improved pressure relief valve comprising:

a valve body, said valve body including an inlet opening, an outlet opening and a valve means;

nozzle means joined to said inlet opening of said valve body for receiving a fluid pressure to be controlled by said valve means to the outlet opening, said nozzle means including a throat located within said valve body and means for mounting a pitot tube;

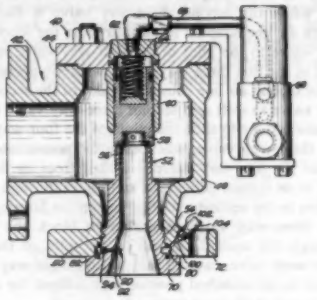
an annular port disposed about the periphery of said nozzle at the interface between said valve body and said nozzle;

means for sealing said annular port for maintaining the fluid pressure within said annular port;

a pitot tube mounted to said mounting means of said nozzle

and extending into said nozzle for communication of the pressure within said nozzle to said annular port;

outlet means disposed in said valve body for communicating the pressure within said annular port to the exterior of said



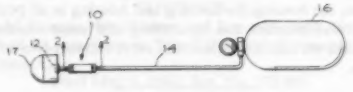
valve body for controlling a remote means; and said annular port providing communication of the fluid pressure within said nozzle to said outlet means regardless of the angular position of said nozzle and pilot tube with respect to said valve body.

4,462,421

HIGH PRESSURE ELECTRICAL INSULATOR

Oakley G. Ross, Upland, and Larry D. Wedertz, Mira Loma, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jul. 30, 1982, Ser. No. 403,695
Int. Cl.³ F16K *15/02, 17/04;* **F16L** *13/00*
U.S. Cl. 137—542 **25 Claims**



1. An electrical insulator for providing a coupling between a pair of metallic tubes containing a pressurized fluid comprising:

a molded insulating member forming a rigid block of electrical insulating material;

first and second metallic end components having facing portions embedded in said insulating material by the molding of the insulating material about said portions, said portions being separated by a gap and being configured to minimize the frontal area accessible to pressurized gas in the vicinity of said gap;

a fluid passageway extending through said first end component, said insulating member and said second end component; and

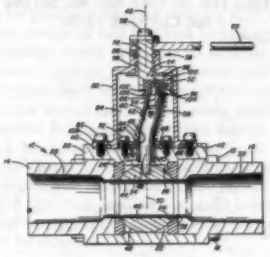
a valve located in said first metallic end component and movable to either an open position to allow fluid to flow from an external source through said fluid passageway in a first direction or to a closed position to prevent fluid from flowing in the opposite direction.

4,462,422

BELLOWS SEALED STEM FOR ROTARY VALVE

James R. Owoc, and Richard P. Tremblay, both of Pittsburgh, Pa., assignors to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Filed Mar. 11, 1982, Ser. No. 357,050
Int. Cl.³ F16K *41/10*
U.S. Cl. 137—557 **12 Claims**



1. A valve comprising,

a valve body,

a passageway extending through said valve body for the flow of fluid therethrough,

a valve member positioned in said passageway for movement between an open position and a closed position to open and close said passageway,

actuating means rotatable about an axis for moving said valve member between the open position and the closed position,

a valve stem extending between said valve member and said actuating means,

said valve stem having an upper end portion,

bearing means carried by said actuating means for connecting said actuating means to said valve stem upper end portion to transmit rotation from said actuating means to said valve stem,

said valve stem having a lower end portion connected to said valve member for transmission of rotation from said actuating means to said valve member,

said bearing means being positioned on said actuating means laterally displaced from said actuating means axis,

said valve stem upper end portion having an axis of rotation and said valve stem lower end portion having an axis of rotation,

said valve stem lower end portion axis being axially aligned with said actuating means axis,

said valve stem upper end portion axis being laterally displaced from said actuating means axis and said valve stem lower end portion axis to provide said valve stem with a bent configuration,

said valve stem upper end portion being rotatably received in said bearing means to maintain said valve stem upper end portion axis in spaced relation to said actuating means axis,

a bellows surrounding said valve stem to provide a hermetic seal around said valve stem between said valve body and said actuating means,

said bellows having a bent configuration corresponding to the bent configuration of said valve stem,

said valve stem having an outer surface and said bellows having an inner surface positioned closely adjacent to said valve stem outer surface such that said valve stem supports said bellows against lateral deflection when subjected to pressure forces to prevent distortion of said bellows, and

wear resistant means positioned between said valve stem outer surface and said bellows inner surface for reducing

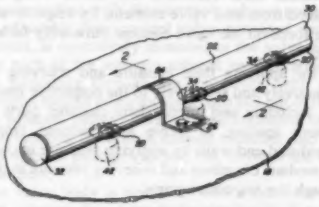
the frictional wear between said bellows and said valve stem.

4,462,423

CO_2 SNOW FORMING HEADER

Paul R. Franklin, Jr., 5211 W. Beaver St., Jacksonville, Fla. 32205

Filed Feb. 8, 1983, Ser. No. 464,975
Int. Cl.³ A01G 15/00
U.S. Cl. 137—561 A 8 Claims



1. A closed bottom heat exchange tank for containing CO_2 snow, said tank including upstanding and interconnected side wall portions and a top wall extending between and interconnecting the upper marginal edge portions of said side wall portions, a CO_2 snow forming header pipe generally paralleling and closely overlying said top wall, means removably anchoring said header pipe to said top wall, one end of said header pipe being open for sealed communication with a liquid CO_2 supply line and the other end of said header pipe being closed, a plurality of depending tubular nipples including upper ends shaped to conform to the opposing external lower surfaces of said header pipe and secured to the latter at points spaced longitudinally therealong, said lower surfaces including means defining restricted flow outlet openings therethrough opening downwardly into the interiors of the upper ends of said nipples, said top wall including a plurality of openings formed therethrough and downwardly through which said nipples extend and are loosely received for upward retraction of said nipples through said openings, said nipples each including a minimum cross sectional area at least several times the minimum cross sectional area of the corresponding outlet openings.

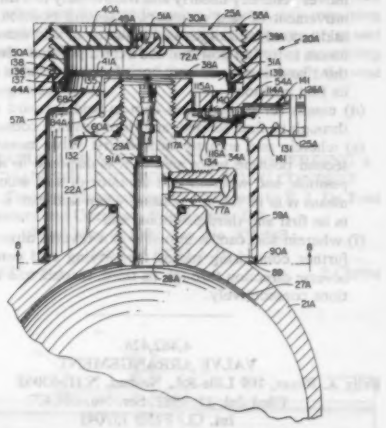
4,462,424

PROPELLANT STORAGE CONSTRUCTION, PARTS THEREFOR AND METHODS OF MAKING THE PARTS

Francis S. Genbauffe, Irwin; Joseph J. Erdelsky, Jeannette, and Harvey J. Shopsky, Latrobe, all of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 2, 1981, Ser. No. 326,703
Int. Cl.³ B65D 83/00
U.S. Cl. 137—613 25 Claims

1. In a propellant storage construction having a storing chamber for storing said propellant and a passage means leading to said storing chamber and containing a valve unit therein for opening and closing said passage means, said construction having a pressure regulator means operatively associated with said valve unit for operating said valve unit in relation to the pressure of said propellant, said pressure regulator means comprising a self-contained capsule having a movable wall for engaging said valve unit and an opposed wall spaced therefrom by a side wall, said construction having wall means cooperating with said capsule to define an output chamber for receiving propellant dispensed from said storing chamber through said valve unit, annular sealing means disposed between and against said capsule and said wall means to define said output chamber therebetween, the improvement wherein said annular sealing means is telescoped onto said side wall of said capsule and thereby engages and seals against said side wall of said capsule



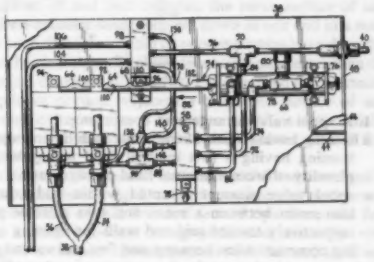
intermediate said opposed wall and said movable wall of said capsule.

4,462,425

BACKFLUSHING SYSTEM

Richard J. Mehus, Minneapolis, Minn., assignor to Economics Laboratory, Inc., Saint Paul, Minn.

Filed Jul. 13, 1981, Ser. No. 283,022
Int. Cl.³ F16K 11/10
U.S. Cl. 137—624.18 6 Claims



1. Apparatus for sequentially controlling flow of water and sanitizing agent through a flushing conduit, into the main milk flow line of an automatic milking device, and out through a milking claw through which milk is drawn from a cow, comprising:

(a) first valve means for regulating flow of rinse water into the flushing conduit, said first means including an actuator movable between a first position wherein rinse water is premitted to enter the conduit, and a second position wherein entry of rinse water into the conduit is precluded, and wherein said actuator is biased to its second position;

(b) second valve means for regulating flow of sanitizing agent into the flushing conduit, said second means including an actuator movable between a first position wherein sanitizing agent is permitted to enter the conduit, and a second position wherein entry of sanitizing agent into the conduit is precluded, and wherein said actuator of said second means is biased to its second position;

(c) a cam having first, second, and third lands, and being movable in a forward direction among a first position

wherein said first land urges said actuator of said first valve, means to its first position, said cam extends and moves generally linearly and transversely to a direction of movement of said actuators, a second position wherein said second land urges said actuator of said second valve means to its first position, and a third position wherein said third land urges said actuator of said first valve means to its first position;

(d) means for driving said cam in said forward direction through its first, second, and third position consecutively;

(e) wherein said actuator of said first valve means is in its second position when said cam is disposed in its second position, and wherein said actuator of said second valve means is in its second position when said cam is disposed in its first and third positions; and

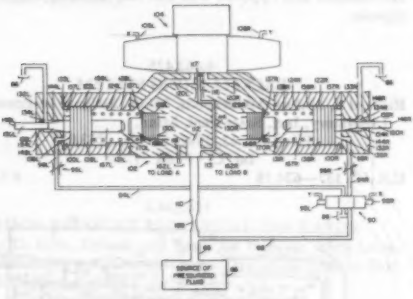
(f) wherein said cam is movable in a reverse direction, and further comprising means for driving said cam in said reverse direction through its third, second, and first positions consecutively.

4,462,426

VALVE ARRANGEMENT

Felix A. Rexer, 109 Lille Rd., Nashua, N.H. 03062

Filed Jul. 17, 1981, Ser. No. 284,477
Int. Cl.³ F15B *13/043*
U.S. Cl. 137—625.63 **7 Claims**



1. A spool valve arrangement comprising:

a housing having a pair of end walls each having a port, said housing having a first internal fluid passageway and a plurality of second internal fluid passageways;

a spool valve element mounted within said housing for movement between a mean and two extreme positions respectively toward said end walls for opening and closing communication between said first and second passageways, said element having a pair of outwardly facing faces; and

positioning means for controlling the position of said spool valve element between its said mean and extreme positions and comprising;

a. a pair of pistons, each piston having an inwardly and an outwardly facing face on opposite sides thereof;

b. a pair of cylindrical walls, a different one for each said piston and arranged beyond said extreme positions coaxially with each other and said element, each cylindrical wall receiving its respective piston in fluid sealed relation for forward, and backward axial motion, each housing end wall, a corresponding cylindrical wall, and a corresponding outwardly facing piston face defining a different outer, piston chamber each having a piston chamber inlet port, and each inwardly facing element face, a corresponding cylindrical wall, and a corresponding element face defining a different intermediate chamber, each between c different outer chamber and the spool valve element, each said intermediate chamber having a port;

c. a pair of spears each carried by a different piston and extending outwardly from its piston outer face toward a distal end, said spear having a portion the cross sectional area of which taken transverse to the piston motion, diminishes with distance from its said piston outer face, so that as said piston moves toward, or away from the adjacent end wall, said portion correspondingly advances into and withdraws from the port in the adjacent end wall, and the area of that port available for fluid passage is accordingly diminished or enlarged;

d. means controlled respectively by said pistons and each extending from the inwardly facing piston, faces into a different inner chamber, said means being normally spaced from said valve element, for respectively exerting force on the valve element outwardly facing faces; and

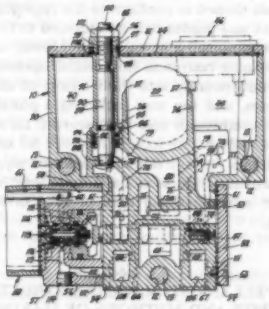
means for applying fluid pressure and relieving pressure alternatively and selectively to the respective inner chambers, including said intermediate chamber ports to exert pressure tending to move said element respectively toward said end walls by applying pressure in one of said intermediate chambers and relieving pressure in the other, through the respective ports.

4,462,427

FOUR-WAY STACKING VALVE WITH COMMON ELECTRICAL CONDUIT AND BODY MOUNTED INDIVIDUAL EXHAUST FLOW CONTROLS THAT PROJECT THROUGH THE COVER

James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to MAC Valves, Inc., Wixom, Mich.

Filed Feb. 26, 1982, Ser. No. 352,768
Int. Cl.³ F15B *13/08*
U.S. Cl. 137—625.64 **7 Claims**



1. A four-way air valve which includes a valve body with a pressurized air supply chamber, a pair of cylinder chambers and a pair of exhaust chambers, and a main valve spool axially movable between two operative positions in a valve spool bore in the valve body to control flow of pressurized air from the air supply chamber to a selected one of said cylinder chambers while simultaneously controlling the exhaust from the other cylinder chamber to a selected one of said exhaust chambers, a top cover releasably mounted on said valve body, and means for moving the main valve spool between the two operative positions, characterized in that:

(a) said air supply chamber is disposed centrally along the valve spool bore, with the cylinder chambers disposed along the valve spool bore on opposite sides of said air supply chamber and adjacent thereto, and with the exhaust chambers disposed along the valve spool bore with one of the exhaust chambers adjacent to each one of the cylinder chambers on a side thereof opposite to the side adjacent to the air supply chamber;

(b) the valve body is provided with a pressurized air inlet

port which is connected by passage means in the valve body to the air supply chamber;

(c) the valve body is provided with two cylinder ports which are each connected by separate passage means to one of the cylinder chambers;

(d) the valve body is provided with a single exhaust port which is connected by a passage means to a common exhaust passageway in the valve body, and each of the exhaust chambers is connected to the common exhaust passageway by a separate exhaust passage;

(e) each of said separate exhaust passages between each exhaust chamber and the common exhaust passageway includes a bore portion forming a valve seat on one end communicating with the common exhaust passageway;

(f) an adjustable flow control valve, provided with a valve element, is operatively mounted in the valve body adjacent each of the separate exhaust passage bore portions and projecting through the top cover, with the valve elements thereof being movable into and out of the respective adjacent passage bore portions to control the flow of air exhausting from each exhaust chamber into the common exhaust passageway and out through the single exhaust port;

(g) the valve body is provided with a common electrical wire passage that extends longitudinally therethrough; and,

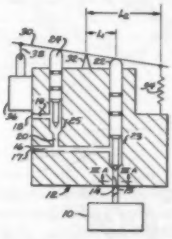
(h) the valve body is provided with an electrical wire tuck chamber on each side of the common electrical wire passage for receiving electrical lead wires from the common electrical wire passage.

4,462,428

THREE-WAY NEEDLE VALVE

Kenneth L. Guenther, Park Ridge; Edward H. Zemke, Chicago, both of Ill., and Gerald D. Warden, Easton, Pa., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 22, 1982, Ser. No. 350,924
Int. Cl.³ F16K *11/14*
U.S. Cl. 137—868 **13 Claims**



1. A three-way control valve assembly comprising:

a housing having an inlet passageway for admitting a fluid under pressure;

a main outlet passageway for said fluid in said housing;

a first needle valve movable between open and closed positions and interposed in the flow between said inlet passageway and main outlet passageway for interrupting the flow of said fluid from said inlet to said main outlet passageway;

a vent passageway in said housing communicating with said main outlet passageway;

a second needle valve interposed in the flow between said vent passageway and main outlet passageway and movable between open and closed positions;

a coupling device arranged to transmit a force applied by the pressurized fluid against said first needle valve from said first needle valve to said second needle valve;

a biasing device for urging said first needle valve into a closed position;

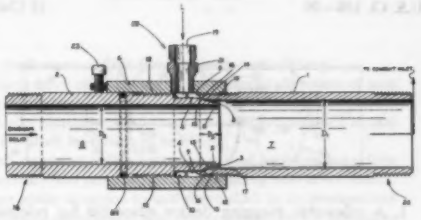
an actuator device arranged to urge said second needle valve toward a closed position, whereby when said first needle valve is open the force transmitted to the second needle valve aids in maintaining the second needle valve closed and when said first needle valve is closed, any remaining pressurized fluid in said main outlet passageway urges said second needle valve toward an open position permitting said remaining pressurized fluid to pass through the vent passageway.

4,462,429

APPARATUS AND METHOD FOR TRANSFERRING A BINGHAM SOLID THROUGH A LONG CONDUIT

David L. Coursen, Mercersburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 6, 1982, Ser. No. 375,543
Int. Cl.³ F17D *1/16*
U.S. Cl. 137—891 **7 Claims**



1. Apparatus for aiding in the transfer of a Bingham solid by lubricated plug flow through a conduit comprising:

(a) a first cylinder open at both ends and having a substantially uniform internal diameter;

(b) a second cylinder open at both ends and having a substantially uniform internal diameter less than the internal diameter of said first cylinder, the outer surface of said second cylinder being stepped down at one end in a manner such that (1) an initial stepdown portion has a diameter which is less than the outer diameter, and greater than the internal diameter, of said first cylinder, and (2) a terminal stepdown portion, adjacent a blunt end surface of said second cylinder, has a diameter which is substantially uniform and less than the internal diameter of said first cylinder; and

(c) a third cylinder open at both ends and fitted over, and in fluid-tight, axially rigid, coupling engagement with, overlapping ends of said first and second cylinders, said first and second cylinders being positioned coaxially with respect to one another in a manner such that said blunt end surface adjacent said terminal stepdown portion of the outer surface of said second cylinder is inside said first cylinder, thereby forming coaxial, communicating, first and second cylindrical chambers delimited by the plane which passes through said blunt end surface, said initial stepdown portion of the outer surface of said second cylinder, the end surface of said first cylinder adjacent thereto, and a portion of the inside surface of said third cylinder together forming an annular chamber coaxial with said first and second cylindrical chambers, the relative displacement of said first and second cylinders along their common axis being adjustable at their coupling with said third cylinder, thereby allowing said annular chamber to be (1) closed to said cylindrical chambers whereby a portion of a surface between said initial and terminal stepdown portions of the outer surface of said second cylinder is in contact with a conforming portion of a facing surface at the end of said first cylinder, or (2) open as a result of the separation of said conforming surface portions, said separation forming an annular passageway connecting said annular chamber with said first cylindri-

cal chamber, said annular passageway having a constricted throat portion and a wider exit portion that is coaxial with, and ends in said plane which delimits, said cylindrical chambers, the distal end of said second cylinder being adapted to connect with a source of Bingham solid, and the wall of said third cylinder containing a passageway from its outer surface to said annular chamber adapted to connect with a source of lubricating liquid, and the distal end of said first cylinder being adapted to connect with a conduit for receiving Bingham solid and lubricating liquid exiting from said first cylindrical chamber.

4,462,430

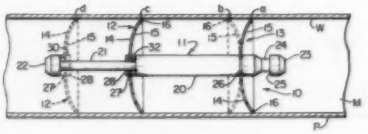
PIPE PLUGGING DEVICE

Leonard R. Anthony, 4680 S. Acoma, Englewood, Colo. 80110, and Ted N. Anthony, 5523 S. Datura, Littleton, Colo. 80120

Filed Sep. 20, 1982, Ser. No. 419,798

Int. Cl.³ F16L *55/10*

U.S. Cl. 138—89 **15 Claims**



1. A releasable plugging device adaptable for releasable insertion into the interior of a tubular member comprising:

an elongated rigid central support member; and

a pair of flexible sealing means in the form of disks, having generally concavo-convex surfaces mounted in coaxial spaced relation to one another on said support member, at least one of said sealing means being slidable in an axial direction with respect to said central support member toward and away from the the other of said sealing means, said central support member defined by an elongated cylindrical member having a main body portion provided with a disk-receiving groove therein and a reduced distal extension of said main body portion receiving the other of said disks and terminating in a limit stop member at one end opposite to said main body portion, each said sealing means terminating in an outer circumferential edge having an effective diameter greater than that of the internal diameter of said tubular member whereby to move into close-fitting sealed engagement with the internal wall surface of said tubular member solely by insertion of said central member lengthwise into said tubular member, each of said sealing means operative to undergo reversal of its concave and convex surfaces into convex and concave surfaces, respectively, in response to sliding movement through said tubular member in the direction that each said concave surface is facing.

4,462,431

METHOD AND APPARATUS FOR FORMING Z-SHAPED FOLDS IN A TUBULAR FILM AND FOR INSERTING THE LATTER INTO A WOVEN TUBING

Frank Bouse, Tecklenburg, and Karl-Heinz Lage, Lengerich, both of Fed. Rep. of Germany, assignors to Wind Nöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,339

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111829

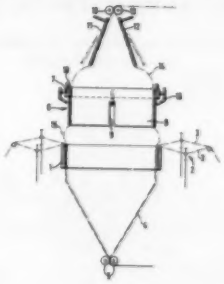
Int. Cl.³ D03D *37/00, 49/00;* **D03J** *1/00*

U.S. Cl. 139—13 R **7 Claims**

1. A method of forming Z-shaped folds in a tubular film and of inserting said tubular film into a woven tubing as the latter is woven and collapsed in a circular loom, said method comprising:

squeezing a tubular film between pairs of pinch rollers;

inflating the tubular film to form a bubble supported by annular surfaces at a weaving ring and at a distance from the latter so that the bubble bulges between the annular surfaces so as to form an annular bead; and



forming a Z-shaped annular fold in the tubular film by pushing into a weaving ring an edge portion of said annular bead which is remote from the weaving ring.

4,462,432

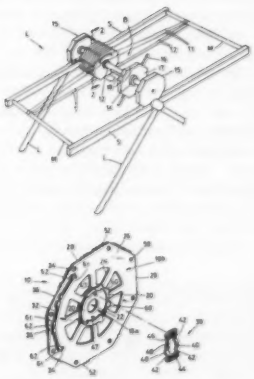
HAND WEAVING MACHINE

Geza J. Sajo, and Agnes Sajo, both of Toronto, Canada, assignors to Masterweaver (1982) Ltd., Toronto, Canada

Filed Sep. 29, 1982, Ser. No. 427,906

Int. Cl.³ D03D *29/00*

U.S. Cl. 139—33 **12 Claims**



1. A shedding device for use in a loom, for the separating of warp threads in such a loom, and comprising;

a plurality of thread separator discs having inner and outer portions;

inner annular abutment means on one side of said inner portion of each said disc on which a said warp thread may lie when in its lower position;

outer abutment means on a face of said outer portion of said disc, subtending a predetermined arc, on which a said warp thread may lie when in its raised position;

a central opening through said inner portion of said disc, through which adjacent discs can be arranged and switched individually in different consecutive angular positions on a horizontal shaft by aid of spring biased detent means partially extending into said opening;

groove means on said inner portion for receiving said inner annular abutment means of a next adjacent disc;

groove means on said outer portion for receiving said outer abutment means of an adjacent said disc;

a plurality of openings formed through said disc between said inner and said outer portions;

spoke means defined by said openings located at spaced apart locations and extending between said inner and outer portions, and,

driving means on both ends of the said shaft for causing rotation of the shaft between two weft interlacings, whereby to angularly displace all of said discs together in unison, for shedding of warp threads carried thereon.

4,462,433

MECHANICAL WARP STOP MOTION APPARATUS

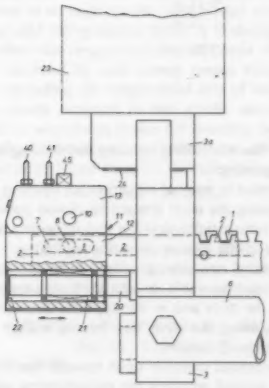
Martin Graf, Horgenberg, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Sep. 24, 1982, Ser. No. 423,166

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146781

Int. Cl.³ D03D *51/28*

U.S. Cl. 139—358 **7 Claims**



1. A mechanical warp stop motion apparatus which includes a multiplicity of spaced apart outer serrated bars which are stationarily mounted to be parallel, side-by-side relationship; a multiplicity of inner serrated bars, each inner serrated bar being movable in its longitudinal direction within an outer serrated bar; and means to move each inner serrated bar with respect to its associated outer serrated bar and to detect when any of the inner serrated bars are prevented from movement with respect to its associated outer serrated bar by a drop wire falling across the serrations of the bars, said movement and detection means including a housing into which an end portion of each inner serrated bar extends, drive means connected to the housing to move it back and forth in the longitudinal direction of the inner serrated bars, and multiplicity of coupling and control elements located in the housing, a separate coupling and control element being attachable and disengagable from the end of each inner serrated bar located in the housing, and separate means in the housing in contact with each coupling and control element to determine if it has become at least partially disengaged from the end of its associated inner serrated bar due to blockage of movement of the inner serrated bar due to a drop wire falling across the associated inner and outer serrated bars.

4,462,434

WEFT RESERVOIR FOR FLUID-JET LOOMS

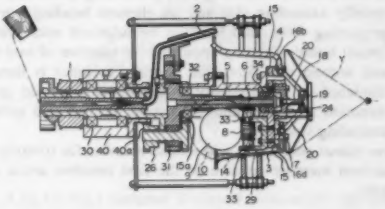
Yujiro Takegawa, Ishikawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Mar. 5, 1982, Ser. No. 355,119

Claims priority, application Japan, Mar. 6, 1981, 56-033001

Int. Cl.³ D03D *47/36*

U.S. Cl. 139—452 **5 Claims**



1. A weft reservoir for fluid-jet looms comprising

a rotary drive shaft extending in the axial direction of said weft reservoir,

an axially elongated, stationary base bracket mounted to said drive shaft by means of bearings,

a weft reserving section coupled to said base bracket whilst spacedly and concentrically embracing said drive shaft.

a yarn guide mounted to said drive shaft in an arrangement rotatable around said weft reserving section for formation of windings of weft to be reserved,

a weft transfer mechanism coupled internally to said weft reserving section and driven for rotation by said drive shaft for transfer of said windings of weft on said weft reserving section in the axial weft delivery direction,

means coupled to said base bracket and for concentrically adjusting the diameter of said weft reserving section when manually operated, and

means coupled to said base bracket and for maintaining the relative position of said weft transfer mechanism with respect to said weft reserving section unchanged despite adjustment in diameter of said weft reserving section.

4,462,435

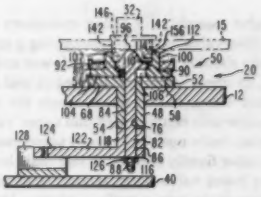
APPARATUS FOR SECURING A COMPONENT TO A PRINTED CIRCUIT BOARD

George J. Whitley, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 6, 1983, Ser. No. 455,992

Int. Cl.³ B21F *11/00*

U.S. Cl. 140—105 **6 Claims**



1. Apparatus for securing a component to a printed circuit board comprising:

a support structure;

at least one component element bending assembly;

means secured to the support structure for aligning a printed circuit board relative to said bending assembly;

said bending assembly comprising a stationary first member

secured to the support structure and a second member rotatable about an axis relative to said first member, said first member having at least one radially extending slot extending in a given direction relative to said support structure and the second member having at least one spirally extending slot extending away from said axis and corresponding to and overlying the radially extending slot, a component bending member having a base portion in said radially extending slot, a camming portion in said spirally extending slot and an element bending portion projecting from said slots to be adjacent said printed circuit board whereby upon relative rotation of said first and second members, said bending member is linearly displaced in said radially extending slot in said given direction as said camming portion follows said spirally extending slot; and

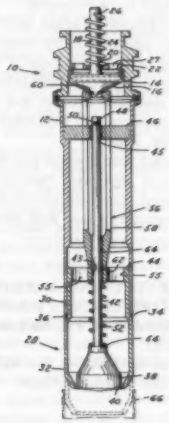
drive means coupled to said second member for rotating the second member relative to the first member about said axis.

4,462,436

FILLER MEANS FOR CHARGING CONTAINERS

Badruddin K. Rangwala, Farmington Hills, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 27, 1982, Ser. No. 423,777
Int. Cl.³ B67C 3/02
U.S. Cl. 141—250 **8 Claims**



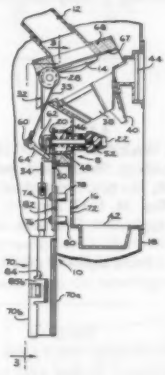
1. A filler valve assembly for filling containers with liquid products, said filler valve assembly comprising a main body, a lower valve body slidably mounted in the lower end portion of the main body, an upper valve seat formed in said main body, an upper control valve, first resilient means for urging said upper control valve into contact with said upper valve seat, an inlet into said main body upstream of said upper control valve, a flow control valve fixedly secured in said main body so as to extend into said lower valve body, second resilient means for urging said lower body into a sealing relationship with said flow control valve, and extension means connected between said upper control valve and said lower valve body while retaining said flow control valve in a fixed position, for lowering said lower valve body relative to said flow control valve upon opening movement of said upper control valve in response to a measured volume of incoming fluid under pressure past said upper control valve to thereby discharge a measured volume of fluid product.

4,462,437

DOOR CONTROL DEVICE WITH CLOSURE REGULATOR

Luis E. Prada, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 9, 1981, Ser. No. 328,978
Int. Cl.³ B65B 3/04
U.S. Cl. 141—360 **4 Claims**



1. Apparatus for controlling opening and closing movement of a door, comprising:

means responsive to manual actuation for opening the door;

means for biasing the door toward its closed position;

a device for substantially slowing and impeding movement of the door in the closing direction including;

a flexible sealed container arranged to reciprocate over a distance and movable in one direction responsive to opening the door and in the opposite direction responsive to closing the door and having a high viscosity fluid contained therein,

a stationary channel member open toward the sealed container and located adjacent the reciprocating sealed container and housing the roller, said channel having a first section and a second section with side walls and a sloping bottom wall between the sections, said sections and walls cooperating to provide a roller guide in the channel member with the roller movable between the sections, said first section bottom wall located from the undeformed sealed container a distance substantially equal to the diameter of the roller and second section bottom wall located from the undeformed sealed container a distance less than the diameter of the roller,

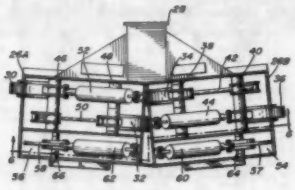
a roller in contact with the sealed container, said roller being freely movable and having rotary and reciprocating motion within the roller guide of the stationary channel member upon engagement with the flexible sealed container,

whereby movement of the door to its open position will move the sealed container and frictionally engage the roller and move it into the first channel section and compress the biasing means and movement of the door to its closed position by the biasing means moves the roller into the second section causing the sealed container to be deformed by the roller and movement of the door to its closed position is sloed and impeded by reason of the viscosity of the material therein.

4,462,438
DUAL HEAD DELIMBER

Pierre Gaudreault, Alma, Canada, assignor to Les Equipments Forestiers SLR Inc., Quebec, Canada

Filed Dec. 10, 1982, Ser. No. 448,436
Int. Cl.³ B27L 1/00
U.S. Cl. 144—2 Z 14 Claims



1. A dual head delimber for mounting to one end of the mobile boom of a machine of the type used for delimbing felled trees, the boom having a longitudinal axis, comprising:

a cradle structure adapted to be fixedly mounted to said one end of said boom;

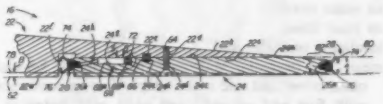
two sets of clamp means pivotally mounted to said cradle structure, the sets being juxtaposed to one another and mounted so that at least one set of said clamp means is disposed at an angle to the longitudinal axis of said boom so that said clamp means define a V-shaped arrangement and effect convergence of the butt ends of two grappled trees received by said clamp means toward a vertical plane including the longitudinal axis of said boom; and

driving means mounted in said cradle structure and connected to said clamp means for pivoting the clamp means of each set toward and away from one another to grapple one or more felled trees for delimbing.

4,462,439
CHAIN SAW WITH SINGLE-WEDGE, CHAIN-PROTECTING CHAIN SUPPORT

Joseph E. Dagenais, 3712-17th Ave., Vernon, B.C., Canada V1T 1C1

Filed May 31, 1983, Ser. No. 499,306
Int. Cl.³ A01G 23/08
U.S. Cl. 144—34 R 9 Claims



1. A chain saw mountable on a powered vehicle to fell trees comprising

plate-like chain-carrying means including a chain bar having a generally planar loop-defining chain run including an exposed cutting run portion and an opposed non-cutting run portion,

a continuous loop saw chain operatively disposed in said run, and

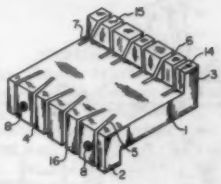
means drivingly connected to said chain for driving the chain around the run,

said bar having a generally planar lower surface extending between said cutting and non-cutting run portions and defining a lower tree-cutting surface, said run being disposed in such a manner that said chain, during operation, defines a lower kerf margin which is generally coincident with said lower surface along said cutting run portion and is disposed not lower than said lower surface along the non-cutting run portion.

4,462,440
REPEATABLE DOVETAIL JIG

John J. Dolfi, R.D. #1, Box 314, Belle Vernon, Pa. 15012

Continuation-in-part of Ser. No. 475,360, Mar. 14, 1983, abandoned. This application Nov. 30, 1983, Ser. No. 556,560
Int. Cl.³ B27F 1/00
U.S. Cl. 144—144.5 R 6 Claims

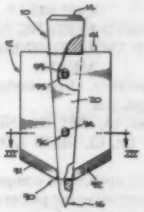


1. A jig having a flattened Z-shaped cross section for cutting pins and tails in the edges of boards so that the boards can be connected by a dovetail joint, said jig comprising a rectangular base having spaced parallel elongated edges, a first leg attached along one elongated edge of said base and extending at a right angle to one surface of said base, a second leg attached along the opposite elongated edge of said base and extending at a right angle to the other surface of said base, said first leg having a plurality of angled saw guide kerfs therein and a plurality of saw guide kerfs in said base connected with said saw guide kerfs in said first leg, said second leg having a plurality of angled saw guide kerfs therein and a plurality of saw guide kerfs in said base connected with said saw guide kerfs in said second leg, whereby said saw guide kerfs in said first leg and the connected kerfs in said base cut the tails of a dovetail joint and said saw guide kerfs in said second leg and the connected saw guide kerfs in said base cut the pins of a dovetail joint.

4,462,441
QUARTERING EDGE

George Hillinger, Los Angeles, Calif., assignor to Alltrade Inc., Commerce, Calif.

Filed Feb. 8, 1983, Ser. No. 464,824
Int. Cl.³ B27L 7/00
U.S. Cl. 144—193 D 4 Claims



1. A splitter wedge generally symmetrical about a central plane and comprising a vertically extending elongated shank having an upper generally flat head constituting an anvil and a downwardly directed cutting edge lying in said plane, the shank having formed therethrough an elongated vertically extending transverse slot,

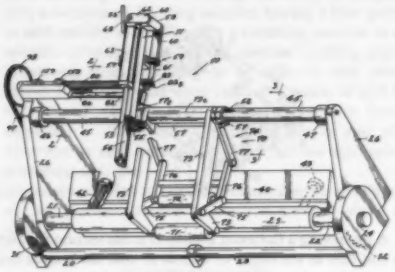
and a second wedge member having a downwardly directed cutting edge, the second wedge including a central section received in said slot.

4,462,442

VENEER LATHE HOLD-DOWN ROLLS

John C. Pointner, 601 Lakeside Ave., Coeur d'Alene, Id. 83814

Filed Aug. 30, 1982, Ser. No. 413,274
Int. Cl.³ B27L *5/02*
U.S. Cl. 144—213 **6 Claims**



1. A hold-down roll apparatus used with a veneer lathe to cut thin sheets of veneer from a wooden log, the veneer lathe having a frame, a pair of chucks for supporting and turning the log, and a knife supported by a knife carriage travelable toward and from the rotational axis of the chucks, comprising:

inner and outer rolls for tangentially contacting and supporting the log in a position substantially coaxial with the lathe chucks; and

a roll carriage for pivotally supporting the rolls upon the lathe frame; said roll carriage comprising:

(a) a main arm pivotally supported upon the lathe frame, said main arm having the outer roll rotatably mounted thereon;

(b) a second arm pivotally connected at one end to the main arm;

(c) a third arm pivotally connected at one end to the second arm;

(d) a fourth arm pivotally connected at one end to the third arm and at the other end to the lathe frame;

(e) said inner roll being rotatably supported near the pivotal connection between said second and third arms; and

(f) a stop bar mounted to the lathe frame for engaging said fourth arm as the roll carriage pivots toward the log to cause the inner roll and outer roll to move relative to each other to maintain the rolls in positions tangential to the log throughout a range of log diameters and to move the rolls closer together for better support of the log.

4,462,443

POSITIONING AND FEEDING APPARATUS FOR LUMBER EDGER INCLUDING IMPROVED CLAMP MEANS

William H. Allen, Sherwood, Oreg., assignor to Kockums Industries, Inc., Talladega, Ala.

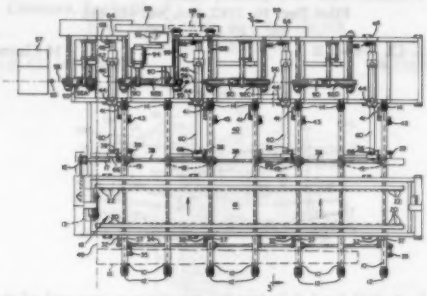
Filed Jun. 14, 1982, Ser. No. 388,308
Int. Cl.³ B27B *1/00*
U.S. Cl. 144—242 R **23 Claims**

1. Edging optimizer apparatus, comprising:

conveyor means for conveying pieces of lumber along a path to an edger cutting means having a cutting axis;

scanner means for automatically scanning each piece of lumber in said path to determine a reference axis for cutting boards therefrom and to produce an output signal corresponding thereto;

clamp means for clamping the lumber in a clamping position, skewing the lumber in response to the output of said scanner means until its reference axis is parallel to said cutting axis, and moving the clamped and skewed lumber to an aligned position where its reference axis is in alignment with the cutting axis of said edger means, said clamp means releasing the lumber and returning from the aligned position to the clamping position along a return path beneath the lumber supported on the conveyor means; and



feeder means for feeding said lumber from its aligned position after release by said clamp means to said edger means longitudianlly along said cutting axis.

4,462,444

INSULATING JACKET FOR A BEVERAGE CONTAINER

Fred G. Larson, Brainerd, Minn., assignor to Pocket Cooler Company, Brainerd, Minn.

Filed Nov. 12, 1982, Ser. No. 441,044
Int. Cl.³ B65B *11/00*
U.S. Cl. 150—52 R **4 Claims**

1. A jacket for fitting about a beverage container, comprising:

an outer cover;

an inner liner;

insulating material; and

means for fastening said insulating material between said outer cover and said inner liner to form a continuous wall with first and second open ends, said fastening means including means for resisting egress of said container from said first open end after said container has ingressed through said second open end.

4,462,445

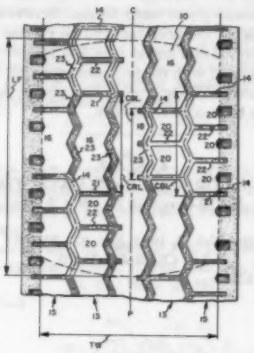
PNEUMATIC TIRE TREAD

René Goergen, Colmar-Berg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 23, 1982, Ser. No. 371,104
Int. Cl.³ B60C *11/06*
U.S. Cl. 152—209 R **7 Claims**

1. A pneumatic truck tire having a ground engaging tread portion characterized by said tread portion having at least two circumferentially extending rows of ground engaging relief elements, each row comprising circumferentially alternating rib portions and block portions, each of said rib portions and block portions having a substantially identical circumferential length ranging from about 20% to 200% of the length of the footprint of said tire, each of said rib portions comprising a

single circumferential relief element, each of said block portions comprised of at least two separate circumferential relief elements of substantially identical length separated by a groove, said rib portions and block portions are arranged about the circumference of the tire such that the block portions of



one row are substantially axially adjacent the rib portions of the other row so that the net contact area of the tread in the footprint of the tire is substantially constant during rotation of said tire, said relief elements of said block portions in said footprint having an area between 30% and 50% of the net contact area of said tire.

4,462,446

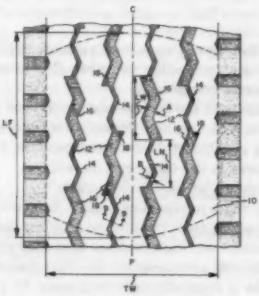
PNEUMATIC TIRE TREAD

René Goergen, Colmar-Berg, Luxembourg, and Jacob Kleywegt, Arlon, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 23, 1982, Ser. No. 371,106

Int. Cl.³ B60C *11/06*

U.S. Cl. 152—209 R **4 Claims**



1. A pneumatic truck tire having a ground-engaging tread portion characterized by said tread portion having a plurality of circumferentially continuous grooves, said grooves comprising alternating circumferentially extending wide and narrow portions of substatially constant width said narrow portions having a width such that the narrow portions do not close up at the surface of the tread when in the footprint of the tire, each of said wide and narrow portions having a circumferential length in the range of 20% to 100% of the length of the footprint of said tire, said narrow portions of said grooves having a width in the range of 20% to 40% of the width of said wide portions of said grooves, said narrow portions and wide portions of adjacent grooves being staggered in a circumferential direction so that the net contact of the area of said tread in said footprint is substantially constant during rotation of the tire and does not vary by more than approximately 10% during rotation, said tread portion having a net contact area in the footprint of the tire of at least 75%, at the juncture of said narrow portion and said wide portion there is provided an axially extending traction surface, said traction surface being oriented at an angle of at least 80° with respect to the mid-circumferential centerplane of the tire.

4,462,447

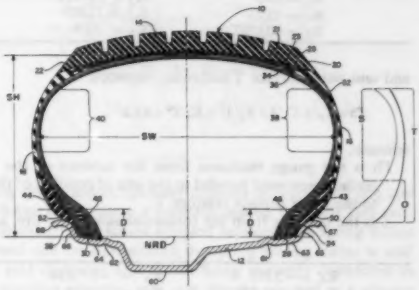
PNEUMATIC TIRE

George J. Siefert, Akron; Michael A. Kolowski, Tallmadge; John E. Lynch, Bedford; Terrence M. Ruip, and Henry L. Gresens, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 15, 1977, Ser. No. 824,757

Int. Cl.³ B60C *13/00, 5/12*

U.S. Cl. 152—353 C **14 Claims**



1. A pneumatic tire for use on a wheel rim including, in combination, a pair of oppositely-opposed bead cores, a carcass structure each end of which is wrapped around a bead core, an apex disposed between the carcass structure and each of the ends thereof, a pair of oppositely-opposed sidewalls overlying said carcass structure, a chaffer strip positioned between said carcass structure and each of said sidewalls, a tread overlying said carcass structure and a belt reinforcing structure positioned therebetween; the improvement comprising: said carcass structure having a carcass aspect ratio of from about 50 to about 70, a pair of oppositely-opposed sidewall portions having a relatively thin radially outer portion and a relatively thick radially inner portion with the ratio of the minimum thinness of the radially outer portion to the maximum thickness of the radially inner portion being from about 1:3.5 to about 1:5, said sidewall portions each have an inner surface of an upper surface portion S and a lower surface portion O and an outer surface T, said upper surface portion S following the natural shape equation:

$$S = -\left[\frac{(\rho_m)^2}{(\rho_o)}\right][F(\theta, K)] - [\rho_o][E(\theta, K)] \quad (I)$$

wherein;

$$\theta = \arcsin\sqrt{\frac{\rho_o^2 - \rho^2}{2(\rho_o^2 - \rho_m^2)}};$$

$$K = \sqrt{\frac{2(\rho_o^2 - \rho_m^2)}{\rho_o}};$$

S is equal to the axial distance from the centerplane to the natural shape line of the carcass structure;

ρ_o is equal to the radius from the axis of rotation at the centerline of the tire to the natural shape line of the carcass structure;

ρ_m is equal to the radius from the axis of rotation to the maximum axial distance on the natural shape line of the carcass structure to the centerplane of the tire;

$F(\theta, K)$ and $E(\theta, K)$ are elliptical integrals of the first and second kind, respectively, said lower surface portion O following equation:

$$O=K_o+K_1X+K_2X^2+K_3X^3+K_4X^4+K_5X^5 \quad \text{(II)}$$

wherein,

O is the axial distance from the mid-circumferential plane of the tire;

X is the distance from the rotational axis of the tire;

$K_o = 6.42$	$K_3 = 1.69715$
$K_1 = 23.81$	$K_4 = .11605$
$K_2 = 10.6733$	$K_5 = .0029$

and said outer surface T following equation:

$$Th=K_o'+K_1'X+K_3'X^3+K_4'X^4+K_5'X^5 \quad \text{(III)}$$

wherein,

Th is the gauge thickness from the contour of the inner surface measured parallel to the axis of rotation of the tire to the outer surface contour T;

X is the distance from the rotational axis of the tire; and

$K_o' = -3.981$	$K_3' = -2.73194$
$K_1' = -44.639$	$K_4' = 0.17864$
$K_2' = 18.2917$	$K_5' = -.004329$

4,462,448

PNEUMATIC TIRES

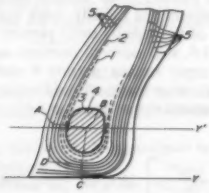
Yasuyoshi Kawaguchi, Higashiyamato; Hideki Aoyama, Niiza, and Eiji Mineki, Higashimurayama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

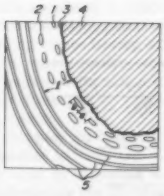
Filed Dec. 15, 1982, Ser. No. 449,938

Claims priority, application Japan, Dec. 25, 1981, 56-215568

Int. Cl.³ B60C *1/00, 15/06*

U.S. Cl. 152—354 R **2 Claims**





1. In a pneumatic tire comprising a pair of bead portions each containing at least one bead core therein and a carcass of at least one rubberized ply extending between the bead portions and containing organic fiber cords therein; and having a load applied to one bead core per unit length of not less than 6.0 kg/cm, the improvement comprising; at least one tire-cord layer of organic fibers arranged as a flipper between the bead core and the carcass ply so that a distance between a portion of the bead core facing the bead base and the carcass ply is within a range of 0.8 to 3.0 mm and at least ⅓ of the periphery of the bead core is covered with the tire-cord layer and a ratio of the bead core covered with the organic fibers in the tire-cord layer adjacent to the bead core is 20–40%.

4,462,449

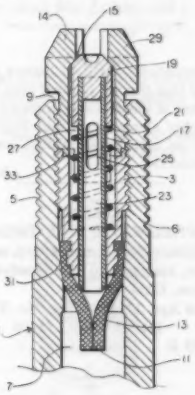
VALVE CORE FOR PNEUMATIC TIRES

John H. Zabel, Jr., 10 Greenhill Dr., Rte. 2, Simpsonville, S.C. 29681

Filed Feb. 2, 1982, Ser. No. 344,981

Int. Cl.³ B60C *23/10*

U.S. Cl. 152—429 **10 Claims**



1. A valve for separating a high pressure area from a low pressure area and providing selective fluid communication between said areas comprising;

a hollow stem with the hollow portion thereof in fluid communication with said high pressure area at one end thereof and being capable of fluid communication with said low pressure area at the other end thereof;

a hollow core within said hollow stem;

said core having a proximal end and a distal end, said proximal end leading said core into said hollow stem and being located nearer said high pressure area than said distal end;

said proximal end comprising a flexible tubular elastomeric member in a normally collapsed state to prevent fluid communication between said high pressure area and said low pressure area but penetrable to permit fluid communication with said high pressure area when said other end is in fluid communication with a source of pressurized fluid at a pressure equal to or greater than the pressure of said high pressure area and wherein said hollow core defines a distal end opening through the distal end thereof, said distal end opening normally being in fluid communication with said low pressure area;

a needle movable positioned within the hollow of said core with a head portion defining a larger area than the area of said distal end opening said needle, being hollow and extending toward said elastomeric member but not contacting said elastomeric member unless moved toward said elastomeric member to penetrate and move through

said elastomeric member against the normally collapsed state thereof; and

means for resiliently urging said needle toward said distal end whereby said head portion normally blocks fluid and road soil communication between said low pressure area and said hollow of said core, said means for resiliently urging being permitting said needle and said head portion to be moved towards said high pressure area and through said elastomeric member to establish fluid communication between said high pressure area and said low pressure area for the inflation or deflaction of said high pressure area through the hollow of said needle.

4,462,450

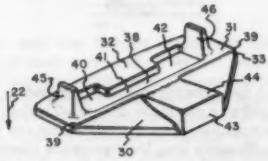
ADAPTER FOR A TIRE BEAD LOOSENING TOOL

Allan J. Robinson, Kent, and William T. Smith, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 348,532, Feb. 12, 1982, abandoned. This application Dec. 1, 1983, Ser. No. 557,373

Int. Cl.³ B60C *25/00*

U.S. Cl. 157—1 **6 Claims**



1. An adapter for use with a bead-loosening tool for demounting a tire mounted on a wheel-rim, said adapter comprising a base plate having axially inner and outer surfaces, with respect to the axis of rotation of said wheel-rim and said tire when the adapter is in its operative position, said axially inner and outer surfaces being substantially parallel to one another, said axially inner surface presenting a configuration that is complementary to the configuration presented by an axially outer end of a side-retaining flange of said wheel-rim, said base plate having a completely enclosed elongated slot therethrough through which force-transmitting and flange-engaging means of said bead-loosening tool may extend, said slot being divided into a plurality of sections along its length with the width of each section being different from the width of the next adjacent section, or sections.

4,462,451

METHOD AND APPARATUS FOR REMOVING TIRES FROM RIMS

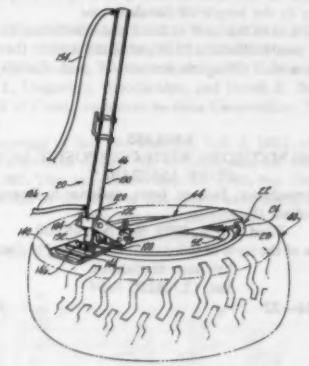
Robert S. Ogren, Owatonna, Minn., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Apr. 20, 1981, Ser. No. 255,787

Int. Cl.³ B60C *25/06*

U.S. Cl. 157—1.17 **14 Claims**

10. A tire dismounting machine for use in dismounting a tire casing from a wheel rim wherein the rim has first and second axially spaced tire-bead retaining flanges, said machine comprising a frame adapted to extend diametrically of the rim to span one side thereof adjacent said first flange, said frame having fixturing means adapted to engage diametrically opposite portions of said first rim flange to restrain movement of said machine axially relative to the rim, and a ram pivotally supported on said frame adjacent one longitudinal end thereof for orientation of the ram with its axis generally parallel to the rim axis in operation of said ram, said ram having a piston with a presser shoe carried on the free end of the piston for movement in a travel path radially outwardly of and adjacent said rim flanges and generally parallel to the axis of the rim through a working stroke extending axially beyond said second rim flange, said frame including means supporting said ram for pivotal motion such that the ram axis can move through a range of about 15°, the end limits of said range being generally parallel to the axis of the rim and an acute angle intersecting the rim axis on the same side of the rim to which said machine is fixtured, means supporting said ram on said frame and operable to yieldably bias said ram toward that end limit of its travel generally parallel to the rim axis, said ram biasing means comprising spring means operably coupled between said ram and said frame for exerting a constant biasing force on said ram, and abutment arm means coupled between said spring means and said ram for transmitting the spring biasing forces to said ram, said abutment arm means being movably connected to said machine whereby said ram may be pivoted to a storage position with its axis oriented generally parallel to the longitudinal axis of said machine frame.



4,462,452

SLAT APPARATUS FOR ROOF CONSTRUCTION

Herman Oskam, Bergambacht, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Jun. 17, 1982, Ser. No. 389,390

Claims priority, application Netherlands, Jul. 15, 1981, 8103355

Int. Cl.³ E06B *9/32*

U.S. Cl. 160—176 R **13 Claims**

1. Apparatus for regulating the radiation of light and/or heat with the aid of slats, suitable for placing under a roof construction, for example, under a translucent roof as is used in greenhouses, said apparatus comprising, in combination:

(a) a plurality of elongate, substantially parallel, slats spaced transversely from one another;

(b) at least two carrier means mounted above said slats and extending transversely with respect thereto;

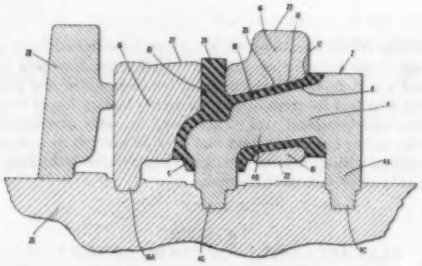
(c) at least one of said carrier means being in the form of a combined carrier and tilting means;
(d) a plurality of pairs of connecting members at the location of said carrier means, whereby each slat is solely connected to the associated carrier means and individually suspended therefrom by means of pairs of connecting members and, at the location of said combined carrier and tilting means, the connecting members of each pair are attached to the slats at two points spaced apart transversely to the length of the slats; and
(e) drive means for said at least one combined carrier and tilting means effective to impart a movement thereto from which a slat tilting movement of said slats is directly derived.

4,462,453

CASTING METHODS WITH COMPOSITE MOLDED CORE ASSEMBLY

David V. Trumbauer, Denver, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 4, 1979, Ser. No. 45,000
The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.
Int. Cl.³ B22C 9/04
U.S. Cl. 164—32 **24 Claims**



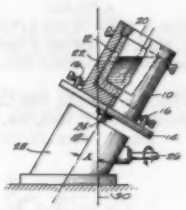
1. In a method of casting metal castings comprising the steps of:
forming a composite core assembly by:
fabricating a first core having an irregular outer surface portion;
molding a layer of cellular plastic material around said irregular outer surface portion of said first core, such that an inner surface of said layer intimately contacts and conforms to the configuration of said irregular outer surface portion of said first core to interlock said first core and said plastic layer together, and such that the outer surface of said plastic layer includes an irregular surface portion;
molding a second core in encompassing relation around said irregular outer surface portion of said plastic layer, such that an inner surface of said second core intimately contacts and conforms to the configuration of the irregular outer surface portion of said plastic layer to interlock said second core and said plastic layer together, and such that the outer surface of said second core is of nonconforming shape relative to the outer surface of said plastic layer, whereupon a composite core assembly is formed;
forming a mold cavity within a pair of mold halves;
inserting said core assembly as an integral unit within one of said mold halves;
closing said mold halves together; and
introducing molten metal into said cavity to form said casting, the improvement comprising
contacting the composite core assembly with a suitable solvent in amounts and for a time sufficient to dissolve the cellular plastic material within the composite core assembly prior to inserting said core assembly as a unit within one of said mold halves.

4,462,454

METHOD FOR REDUCING MACROSEGREGATION IN ALLOYS

Angus Hellawell, Hancock, Mich., assignor to Michigan Technological University, Houghton, Mich.

Filed Nov. 12, 1981, Ser. No. 320,597
Int. Cl.³ B22D 1/00, 13/00
U.S. Cl. 164—133 **9 Claims**



1. A method for reducing macrosegregation in a solidified alloy which exhibits a change in density with changes in composition and temperature during solidification and has a solidification time sufficiently long for segregation channels to form in the partially solidified portion if allowed to solidify in a stationary container, said method comprising the steps of:
pouring the alloy as a liquid into a container having a longitudinal axis, and
slowly rotating the container at a speed which does not produce a centrifuging effect about said axis, with said axis at an angle to the vertical of about 10° to about 50°, from the time the liquid alloy is poured into the container until substantially all of the alloy has solidified, so as to continuously change the direction of gravitational force on the interdendritic liquid and thereby retard the formation of segregation channels in the partially solid portion.

4,462,455

PERMANENT MOLD WITH CORE PULLING DEVICE

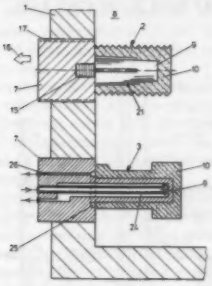
Ivo Henych, and Erwin Fischer, both of Schaffhausen, Switzerland, assignors to George Fischer Ltd., Switzerland

PCT No. PCT/CH80/00076, 371 Date Mar. 5, 1981, 102(e) Date Mar. 4, 1981, PCT Pub. No. WO81/00067, PCT Pub. Date Jan. 22, 1981
PCT Filed Jul. 2, 1980, Ser. No. 243,957
Claims priority, application Switzerland, Jul. 5, 1979, 6289/79
Int. Cl.³ B22C 9/10
U.S. Cl. 164—340 **18 Claims**

1. An apparatus for forming a corbelled cavity in a casting, comprising:
a permanent mold shell having a wall with inner and outer surfaces defining an interior mold cavity;
at least one through bore in said wall opening on said outer surface of said wall and into said mold cavity;
a core holding device removably mounted in said bore, said core holding device having a portion extending radially inwardly from said outer surface with transverse cross-sectional dimensions not greater than corresponding transverse cross-sectional dimensions of said bore such that said core holding device is removable from said bore in a generally radially outward direction relative to said mold cavity;
a metal stud coupled to said core holding device and extending into said mold cavity, said stud having transverse cross-sectional dimensions not greater than said transverse cross-sectional dimensions of said core holding device

such that said stud is removable through said bore with said core holding device; and

a shaped jacket of molding material surrounding said stud, and extending into and terminating within said mold cavity, and said jacket having portions within said mold cavity of enlarged dimensions spaced from said core holding device;



whereby, said core holding device and said stud can be removed from said mold cavity and wall after solidification of molten casting material about said jacket, but prior to removal of the casting from said mold shell, leaving said jacket in the casting for subsequent removal to provide a corbelled cavity in the casting with interior dimensions greater than entry opening dimensions.

4,462,456

TRANSPORT ROLL FOR TRANSPORTING HOT MATERIAL AND TRAIN OF SUCH TRANSPORT ROLLS

Kazuhide Kameyama; Takahiro Kiyofuji, and Yukinori Shigeyama, all of Sakai, Japan, assignors to Nippon Steel Corporation, Otemachi, Japan

Filed Jan. 22, 1982, Ser. No. 341,698

Claims priority, application Japan, Jan. 22, 1981, 56-6474[U]; Jan. 22, 1981, 56-6475[U]; Jan. 22, 1981, 56-6476[U]; Jan. 22, 1981, 56-6477[U]

Int. Cl.³ B22D *11/12*; B21B *31/00*

U.S. Cl. 164—448 **19 Claims**

1. A transport roll for transporting a heavy hot material comprising:

a solid hard metal roll provided on its roll surface with a plurality of ring-like circumferential grooves,

said roll surface between the grooves acting as a metal contacting surface in direct contact with the underside of the heavy hot material,

each of said grooves being partially filled with a heat insulating material to form a heat insulated surface,

said heat insulated surface having its top side parallel to but spaced from the metal contacting surface and spaced below the metal contacting surface by a height difference defining a recessed step,

said recessed step having a depth which is in a ratio ranging from about 0.012 to about 0.25 with the width of each of said grooves,

whereby only the metal contacting surface supports the heavy hot material, and the heat insulated surface prevents heat loss from the heavy hot material without being in direct contact with said heavy hot material.

4,462,457

TRANSFORMER-DRIVEN SHIELD FOR ELECTROMAGNETIC CASTING

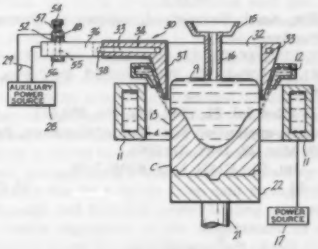
Peter J. Kindlmann, Northford; John C. Yarwood, Madison; Gary L. Ungarean, Woodbridge, and Derek E. Tyler, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 231,209, Feb. 4, 1981, abandoned, which is a division of Ser. No. 111,485, Jan. 14, 1980, Pat. No. 4,285,387. This application Sep. 22, 1982, Ser. No. 421,653

The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—503 **8 Claims**



1. An apparatus for shape control in electromagnetic casting of molten materials, comprising:

means for providing a magnetic field;

an active non-magnetic shield comprising a primary loop magnetic field shielding means for attenuating said magnetic field by intercepting a portion of said magnetic field so that a current is induced in said shielding means; and

means for delivering a bucking current to said primary loop shielding means, said bucking current being selected such that it is out of phase with said current induced in said shielding means by said magnetic field whereby in operation the resulting net current in said shielding means is less than the induced curent.

4,462,458

ELECTROMAGNETIC INDUCTOR WITH A ROTATING FIELD AND APPARATUS FOR THE CONTINUOUS CASTING OF METAL FOR ITS USE

Jacques Ruer, Croissy, France, assignor to Rotelec Société Anonyme, Paris, France

Filed Apr. 2, 1982, Ser. No. 364,664

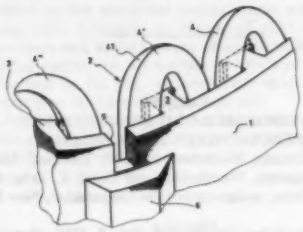
Claims priority, application France, Apr. 3, 1981, 81 06909

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—504 **11 Claims**

1. An electromagnetic inductor of the static polyphase type for producing a rotating magnetic field comprising an annular magnetic yoke and a plurality of poles projecting radially inwardly from said yoke and each provided with an exciter winding, wherein at least two adjacent poles are spaced from

each other in the circumferential direction of said yoke a distance greater than the other poles, and wherein said yoke is



provided in the region between said two poles with a cut-out of predetermined width.

4,462,459

DEVICE FOR AIR CONTROL OF AN ENERGY FACADE WALL

Hans Schmidlin, Aesch, Switzerland, assignor to Eltreva AG, Aesch, Switzerland

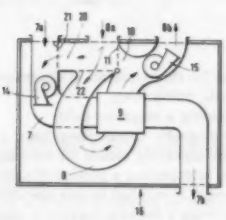
PCT No. PCT/EP81/00102, 371 Date Sep. 4, 1981, 102(e) Date Sep. 4, 1981, PCT Pub. No. WO82/00337, PCT Pub. Date Feb. 4, 1982

PCT Filed Jul. 21, 1981, Ser. No. 302,437

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027648; Mar. 28, 1981, 3112394

Int. Cl.³ F24H *3/02*; F24F *7/08*

U.S. Cl. 165—54 **15 Claims**



1. A ventilation device for a room ventilated by air circulation and including a window having an outer pane (3) on the weather side of the room and an inner pane (4) on the room side, said panes being spaced from each other to form therebetween an air channel (5) having an inlet end connected to the room and an outlet end and receiving air sucked from the room, the ventilation device being formed with a fresh air channel (7) having a fresh air suction opening (7*a*') at said weather side and a fresh air discharge opening (7*b*) at said room side, and an exhaust air channel (8) having an exhaust air discharge opening (8*b*') at said weather side and an exhaust air inlet opening (8*a*) connected to said air channel (5) between said panes at said outlet end (5*a*) of said air channel, said ventilation device further comprising a heat exchanger (9) operatively connectable with said fresh air and exhaust air channels and adapted to transmit heat from exhaust air in said room to the fresh air flowing through said fresh air channel; said ventilation device being formed as an air controlling compact structural unit (16) disposed exclusively inside of the room to be ventilated and connected immediately to said air channel (5) at said outlet end thereof and further including at least one separate air control box (31) and at least one separate ventilator box (32) encompassing said heat exchanger.

4,462,460

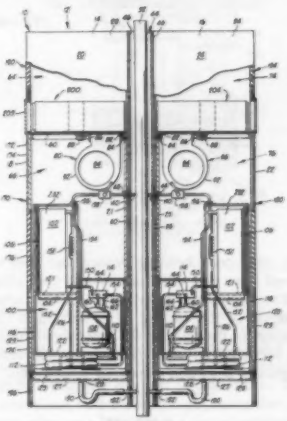
MODULAR AIR CONDITIONING APPARATUS

Alvin S. Braver, Oklahoma City, Okla., assignor to International Environmental Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 040,585, May 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 932,274, Aug. 9, 1978, Pat. No. 4,169,500. This application Aug. 17, 1981, Ser. No. 293,697

Int. Cl.³ F25B *29/00*; F24F *3/00*

U.S. Cl. 165—26 **9 Claims**



1. An improved air conditioning apparatus of the type requiring connection to a source of heat transfer medium for providing simultaneous air conditioning to a first room area and to a second room area on the same floor of a structure, the apparatus comprising:

a housing assembly comprising a first housing compartment having a square cross-section associated with the first room area and a second housing compartment having a square cross-section associated with the second room area, the first housing compartment having three access sides and the second housing compartment having three access sides;

a first mid-panel member having an opening therethrough and supported by the first housing compartment so that the first mid-panel member separates the second housing compartment into an upper second plenum section and a lower second operating section;

a first blower supported by the first mid-panel member in the first operating section and disposed to blow air from the first operating section through the opening in the first mid-panel member into the first plenum section;

a second blower supported by the second mid-panel member in the second operating section and disposed to blow air from the second operating section through the opening in the second mid-panel member into the second plenum section;

a first heat pump assembly having a first air-to-refrigerant heat exchanger and supported by the first housing compartment in the first operating section so that the first air-to-refrigerant heat exchanger is positioned along a selected component access side of the first housing compartment;

a second heat pump assembly having a second air-to-refrigerant heat exchanger and supported by the second housing compartment in the second operating section so that the second air-to-refrigerant heat exchanger is positioned along a selected component access side of the second housing compartment;

first control means for sensing the temperature of the air in the first room area and for controlling the operating of the

first blower and the first heat pump assembly in response thereto;

second control means for sensing the temperature of the air in the second room area and for controlling the operation of the second blower and the second heat pump assembly in response thereto;

a first outlet grille assembly supported by the first housing compartment along a selected one of the access sides thereof, the access side selectable in response to the air conditioning requirements of the first room area, and disposed to direct air from the first plenum section to the first room area;

a second outlet grille assembly supported by the second housing compartment along a selected one of the access sides thereof, the access side selectable in response to the air conditioning requirements of the second room area, and disposed to direct air from the second plenum section to the second room area;

a first intake grille assembly removably supported by the first housing compartment and positionable at the selected component access side thereof in intake air relationship to the first air-to-refrigerant heat exchanger, the first intake grille assembly defining when removed an access port through which the first blower and the first heat pump assembly are selectively removable from the first operating section;

a second intake grille assembly removably supported by the second housing compartment and positionable at the selected component access side thereof in intake air relationship to the second air-to-refrigerant heat exchanger, the second intake grille assembly defining when removed an access port through which the second blower and the second heat pump assembly are selectively removable from the second operating section;

supply means for providing fluid communication from the source of heat transfer medium to the first and second heat pump assemblies;

return means for providing fluid communication from the first and second heat pump assemblies to the source of heat transfer medium; and

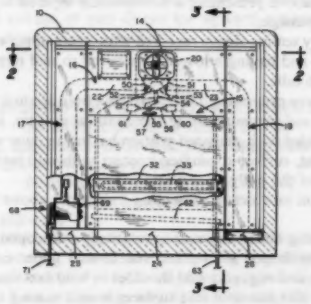
condensate drain means for collecting and disposing of condensate from the first and second heat pump assemblies.

4,462,461

THERMAL MANAGEMENT SYSTEM AND APPARATUS

Hendrie J. Grant, 881 Lincoln Ave., St. Paul, Minn. 55105

Filed May 10, 1982, Ser. No. 376,536
Int. Cl.³ F28F *27/02*
U.S. Cl. 165—26 **3 Claims**



1. Apparatus for controlling the temperature within a vehicular storage chamber comprising, in combination:

(a) a normally closed vehicular storage chamber having a vertical bulkhead dividing said chamber into a relatively large storage compartment and a comparatively smaller heat exchange compartment, said heat exchange compartment being subdivided into a cooling section mounted between adjacent first and second heating sections;

(b) at least one air inlet connection positioned at the bottom of each of said first and second heating and said cooling sections and communicating with the bottom of said storage compartment;

(c) heating means mounted in at least one of said first and second heating sections and coupled in fluid flow communication with the heated engine coolant of a vehicle supporting said storage chamber for extracting heat therefrom;

(d) refreezable cooling means including an eutectic material of sufficient mass having a freezing point below that of an intended storage temperature and mounted in said cooling section for being refrozen during non-use, off-peak times and maintaining said storage temperature as said eutectic material thaws during use;

(e) a fan for discharging air into the top of said storage compartment;

(f) separate ducts coupled to the tops of said first and second heating and said cooling sections and to said fan for supplying air to said storage compartment;

(g) shutter means in said ducts having a first condition in which the ducts to said fan from said first and second heating sections is open and the duct to said fan from said cooling section is closed to prevent gravity flow of air in said cooling section and enable circulation of air between said storage compartment and said first and second heating sections, and having a second condition in which the duct to said fan from said cooling section is open and the ducts to said fan from said first and second heating sections is closed to enable forced circulation of air between said storage compartment and said cooling section and disable the flow of air from said storage compartment through said first and second heating sections; and

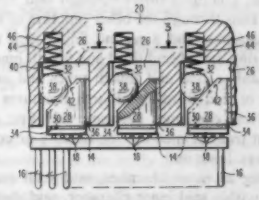
(h) means responsive to the temperature of said storage compartment for controlling which of said ducts are open and closed and thereby maintaining a relatively constant ambient intended temperature in said storage compartment.

4,462,462

THERMAL CONDUCTION PISTON FOR SEMICONDUCTOR PACKAGES

Ralph E. Meagher, Vicksburg, Mich., and Carl D. Ostergren, Montgomery, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1981, Ser. No. 322,322
Int. Cl.³ H01L *23/42*
U.S. Cl. 165—80 C **14 Claims**



1. A semiconductor package having a substrate for supporting at least one semiconductor device mounted on said substrate, a means to join and electrically connect at least one said device to metallurgy on said substrate, a cover on said substrate overlying said semiconductor device, the improvement comprising at least one piston slidably mounted in an opening in said cover, said piston having a top surface which is inclined relative to the longitudinal axis of said piston, a single biasing means in engagement with said top inclined surface, said biasing means urging said piston both longitudinally into contact

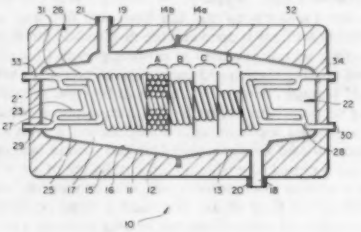
with the back side of at least one said device, and also laterally into contact with a wall of said opening, and a means to prevent rotation of said piston in said opening.

4,462,463

TRIPLE PASS HEAT EXCHANGER

Robert S. Gorham, Jr., 205 W. John, Champaign, Ill. 61820

Filed Apr. 21, 1982, Ser. No. 370,455
Int. Cl.³ F28D 7/02
U.S. Cl. 165—140 11 Claims



1. A heat exchanger, comprising:

an assembly of four helically wound lengths of tubing each having a plurality of turns, said lengths of tubing being arranged relative to each other in a substantially concentric manner, so that the first tube is innermost, the second tube outward to said first tube, the third tube outward to said second tube, the fourth tube outward to said third tube, the first and third tubes being coupled together at a first common juncture of said assembly and coupled together at a second common juncture of said assembly, the second and fourth tubes being coupled together at a third common juncture of said assembly and coupled together at a fourth common juncture of said assembly, whereby a first liquid heat transfer medium entering one of said first and second junctures flows through said first and third tubes and exits through the other juncture of said first and second junctures, and a second liquid heat transfer medium entering one of said third and fourth junctures flows through said second and fourth tubes and exits through the other of said third and fourth junctures in order to produce heat exchange between said first and second liquid heat transfer medium for heating or cooling a primary energy load; and

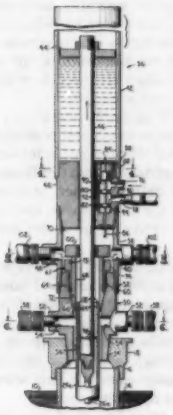
a shell having an inner chamber, said shell enclosing said assembly within said inner chamber, said shell having an inlet port and an outlet port for flowing said third liquid heat transfer medium through said inner chamber in a heat transfer relationship with said assembly in order to heat or cool a secondary energy load, adjacent tubes being in a tight mechanical contact with each other, the turns of said second tube being nested in staggered relationship between the turns of said first tube, the turns of said third tube being nested in staggered relationship between the turns of said second tube, and the turns of said fourth tube being nested in staggered relationship between the turns of said third tube.

4,462,464

WELLHEAD WITH HYDRAULIC PUMP ACTUATOR

Harold D. Brown, Box 518, Hutchinson, Kans. 67501; Leon J. Rohling, and Mark A. Brown, both of Nickerson, Kans., assignors to Harold D. Brown, Nickerson, Kans.

Continuation of Ser. No. 214,564, Dec. 8, 1980, which is a continuation of Ser. No. 938,215, Aug. 30, 1978, abandoned. This application Dec. 4, 1981, Ser. No. 327,683
Int. Cl.³ E21B 43/00
U.S. Cl. 166—68.5 14 Claims



5. In a well having a casing and a tube within the casing through which fluid in the well flows to the ground surface, said casing and said tube having upper terminal ends at or near the ground surface, the combination with said casing and tube of:

an upright, tubular body over said terminal end of the casing and having opposed, upper and lower ends and a central passage communicating with the casing and into which said terminal end of the tube extends through said lower end of the body;

means on said lower end securing the body to the casing,

said body having lateral outlet means communicating with said passage, and being provided with an internal surface thereabove presenting a downwardly tapered segment of said passage;

a unitary sealing sleeve received within said upper end of the body and having a lower tip secured to said terminal end of the tube,

said sleeve presenting a fluid-carrying bore aligned with said tube and communicating therewith at said tip, and being provided with a tapered portion having an outer surface in mating, surface-to-surface contact with said internal surface of the body to seal said passage;

means on said sleeve presenting a shoulder above said portion;

a retaining collar disposed in relatively telescoped relationship with said sleeve, secured to said upper end of the body, and engaging said shoulder to hold said sleeve in the body and maintain said surfaces in said mating contact,

said body, sleeve and collar providing a three-component wellhead assembly for sealing the casing and holding the tube; and

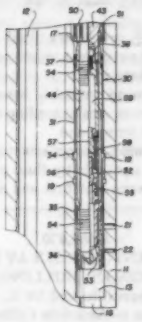
means on said assembly having a passage for receiving fluid from said bore flowing upwardly therethrough, and fluid outlet means communicating with said passage for flow of said fluid therefrom.

4,462,465

CONTROLLING INJECTION OF FLUIDS INTO WELLS

Cynthia E. Strickland, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jun. 28, 1982, Ser. No. 393,064
Int. Cl.³ E21B 23/03
U.S. Cl. 166—117.5 17 Claims



1. A well device for controlling flow between the exterior and interior of a well flow conductor comprising:

a side pocket mandrel having an elongated receptacle and an external side port opening to said receptacle; said receptacle having axially spaced latching recesses;

a flow control assembly, for disposition in said receptacle, including a removable sliding sleeve valve and a coacting removable flow control valve;

said sleeve valve being disposed for movement between an upper closed position and a lower open position relative to said side port; said sleeve valve having releasable latching lug means for latching engagement with a latching recess of said receptacle in said closed position, and biasing means urging said latching lug means outwardly for said latching engagement;

said flow control valve comprising an elongated assembly including an upper latching body and a lower elongated nose configured to be received within said sleeve valve; said latching body including releasable latch means for coacting engagement with a latching recess of said receptacle, and an upper fishing neck for coaction with running and pulling tools;

said nose and said receptacle being configured for coaction with said latching lug means to limit inward movement of said latching lug means to permit downward movement of said sleeve valve to said lower open position and to prevent release of said sleeve for upward movement from said upper closed position.

4,462,466

METHOD OF PROPPING FRACTURES IN SUBTERRANEAN FORMATIONS

Joseph E. Kachnik, Overton Natl. Bank Bldg., 4200 S. Hulen, Ste. 212, Fort Worth, Tex. 76116

Filed Mar. 29, 1982, Ser. No. 362,960
Int. Cl.³ E21B 43/267
U.S. Cl. 166—280 3 Claims

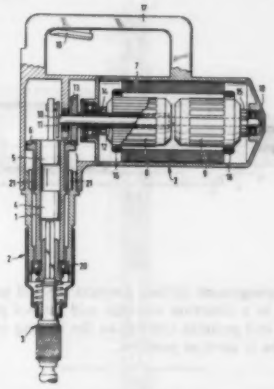
1. A method of propping a fracture in a subterranean formation surrounding a wellbore comprising injecting into the fracture a plurality of particles of propping agent, each particle having at least one passageway formed directly therethrough for increased permeability to flow of fluids from the subterranean formation once flow of fluids is restored; said particles being of a size and density to be flowed into the fracture by hydraulic transport and having adequate compressive strength to resist closure of said fracture and respective said passageway through said particles.

4,462,467

PERCUSSION DRILL MACHINE

Bernhard Weingartner, Feldkirch, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Nov. 9, 1981, Ser. No. 319,616
Int. Cl.³ B23B 45/16; B25D 16/00
U.S. Cl. 173—105 7 Claims



1. Percussion drilling machine comprising a drill shaft with a chuck arranged to hold a drilling tool, a percussive device in cooperating relation with said drive shaft for imparting percussive force to a drilling tool held in said chuck, a first electrical driving unit in engagement with said drill shaft for rotating said drill shaft and a drilling tool held in said chuck, a second electrical driving unit in engagement with said percussive device for imparting percussive force to a driving tool held in said chuck, wherein the improvement comprises that each of said first and second electrical driving units is an electrical motor and each comprises a separate rotatable shaft and separate means for rotating said shaft so that each of said separate means can be controlled independently of the other for regulating the rotational force imparted from said rotatable shafts of said first and second electrical units to said drill shaft and said percussive device, a common stator for each of said separate electrical motors, and a separate rotor for each of said separate electrical motors so that each of said rotors can be controlled independently of the other.

4,462,468

RAM HEAD FOR SELF-DRIVEN PNEUMATIC RAM DRILLS

Gustav Jenne, Schmachtenbergstrasse 183, 4300 Essen-Kettwig, Fed. Rep. of Germany

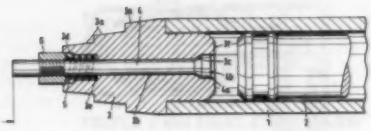
Filed Jun. 16, 1982, Ser. No. 388,829
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 3124524
Int. Cl.³ B25D 9/04
U.S. Cl. 173—121 13 Claims

1. In a ram head for self-driven pneumatic ram drills for producing boreholes in the earth, arranged at the front end of a substantially tubular housing within which an impact piston is movable axially back and forth transmitting impact energy to an anvil surface of the ram head, the ram head being substantially conical and formed with a central axial bore therethrough, an impact bolt being longitudinally displaceably mounted between a front end position and a rear end position thereof in said axial bore, stop means for limiting said impact bolt in said end positions, and spring means supported against the ram head and biasing said impact bolt, the improvement wherein

said impact bolt having an impingement surface facing the impact piston,

said spring means being arranged between said ram head and said impact bolt such that, respectively:

said spring means presses said impact bolt so that said impingement surface is inside said anvil surface of said ram head in said front end position during and constituting a normal position; and



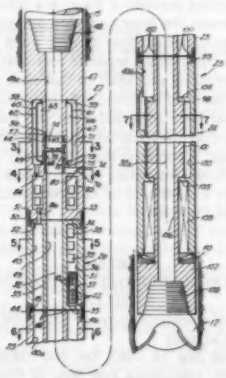
said impingement surface projects beyond said anvil surface in a direction towards said impact piston in said rear end position counter to the biasing of said spring means in another position.

4,462,469

FLUID MOTOR AND TELEMETRY SYSTEM

Robert L. Brown, Buena Park, Calif., assignor to AMF Inc., White Plains, N.Y.

Filed Jul. 20, 1981, Ser. No. 284,729
Int. Cl.³ E21B *4/02*
U.S. Cl. 175—40 **8 Claims**



1. Drilling apparatus for use with a drill string which extends into a well and carries a bit and within which a circulation of drilling fluid is maintained along a predetermined path, comprising:

a fluid motor in the well adapted to rotate the bit and which is driven by a secondary fluid isolated from said drilling fluid;

means exposed to the pressure of said drilling fluid and energized thereby to produce a flow of said secondary fluid through the motor for turning the bit;

a choke in said drill string through which the drilling fluid flows;

said means exposed to the pressure of the drilling fluid at opposite sides respectively of said choke and applying different pressures to said secondary fluid producing said flow thereof through the motor;

valve means operable between a first condition in which a first of said movable walls is exposed to the pressure of drilling fluid at the upstream side of said choke and the second movable wall is exposed to the pressure of drilling fluid at the downstream side of said choke and a second condition in which said first movable wall is exposed to the pressure of drilling fluid at the downstream side of the choke and said second movable wall is exposed to the pressure of drilling fluid at the upstream side of said choke;

means for reversing secondary fluid connections to said motor when said valve means are actuated between said two conditions thereof;

said valve means being rotatable between said conditions thereof and about an axis extending essentially longitudinally of said drill string; and

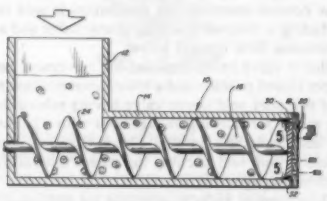
a vaned fluid operated rotary actuator connected to said valve means and operable by fluid pressure to rotate the valve means between said first and second conditions.

4,462,470

EXTRUSION OF BENTONITE CLAY FOR FLUID LOSS REDUCTION IN DRILLING FLUIDS

William Alexander, Naperville, and Ira E. Odom, Vernon Hills, both of Ill., assignors to American Colloid Company, Skokie, Ill.

Division of Ser. No. 309,727, Oct. 8, 1981, abandoned. This application Jan. 24, 1983, Ser. No. 460,175
Int. Cl.³ E21B *21/00*
U.S. Cl. 175—72 **16 Claims**



1. A method of drilling comprising rotating a drilling bit within an earthen structure to form a drill hole defined by a surrounding earthen structure and circulating a drilling fluid containing ground bentonite clay within said drill hole to cool and lubricate said drilling bit, and to carry away drill cuttings from said drill hole, said bentonite clay having improved fluid loss characteristics by forcing said bentonite clay through a die opening while simultaneously shearing said bentonite clay along a plane defined by an entrance to said die opening, and thereafter grinding said bentonite clay.

4,462,471

BIDIRECTIONAL FLUID OPERATED VIBRATORY JAR

James Hipp, 110 Lietmeyer, New Iberia, La. 70560

Filed Oct. 27, 1982, Ser. No. 437,118
Int. Cl.³ E21B *4/14*
U.S. Cl. 175—296 **12 Claims**

1. A bidirectional fluid operated jarring apparatus, which comprises:

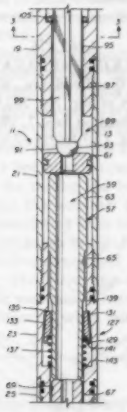
a tubular body having an axially upper end defining a pipe connection and an axially lower end defining downwardly facing body hammer;

a tubular knocker sub having an axially upper end axially movably connected to said lower end of said body for limited axial movement with respect to said body between retracted and extended positions, and an axially lower end defining a pipe connection, said knocker sub including an upwardly facing shoulder defining an upwardly facing anvil engageable with said body hammer, and said knocker sub including an inwardly extending down-

wardly facing internal shoulder defining a downwardly facing internal anvil and an axially spaced apart upwardly facing inwardly extending internal shoulder;

a tubular mandrel having an axial flow passage therethrough axially movably mounted in said body and knocker sub, said mandrel including a mandrel hammer positioned within said knocker sub between said internal shoulders of said knocker sub, said mandrel hammer including an outwardly extending upwardly facing shoulder engageable with said downwardly facing anvil of said knocker sub when said knocker sub is in said extended position and an outwardly extending downwardly facing shoulder engageable with said upwardly facing internal shoulder of said knocker sub when said knocker sub is in said retracted position;

means for forming a sliding seal between said mandrel and said body;



means for urging said mandrel axially upwardly with respect to said body;

and valve means for closing said mandrel flow passage whereby fluid pressure urges said mandrel axially downwardly with respect to said body and opening said mandrel flow passage upon predetermined axially downward movement of said mandrel with respect to said body thereby to allow said mandrel to move axially upwardly with respect to said body such that when said knocker sub is in said extended position upward movement of said mandrel causes said mandrel hammer to strike said knocker sub internal anvil and when said knocker sub is in said retracted position downwardly urging fluid force on said mandrel is transmitted to said knocker sub through said upwardly facing internal shoulder and said body is urged upwardly with respect to said knocker sub and upon opening of said mandrel flow passage said body hammer strikes said knocker sub upwardly facing anvil.

4,462,472

MARINE BEARING FOR A DOWNHOLE DRILLING APPARATUS

Herbert W. Beimgraben, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Continuation of Ser. No. 023,421, Mar. 23, 1979, abandoned. This application May 29, 1981, Ser. No. 268,188

Int. Cl.³ E21B *3/12*

U.S. Cl. 175—320 **1 Claim**

1. A drive shaft and bearing for concurrently supplying driving torque and drilling mud to a well drilling bit, comprising a plurality of axially extending external grooves on said drive shaft for transmitting drilling mud to a drilling bit mounted on the bottom portions of the drive shaft; a stationary tubular housing surrounding the grooved portion of said drive shaft; three concentric sleeves mounted between said grooved portion of the drive shaft and the bore of the housing; the inner sleeve being rigid and secured to the drive shaft in overlying relationship to said axial grooves; the outer sleeve being rigid and keyed to the housing; the central sleeve being formed of

elastomeric material secured to the bore of said outer sleeve and being rotatable relative to said inner rigid sleeve and lubricated by flow of drilling fluid between the external surface of the inner sleeve and the bore of the elastomeric center sleeve; and axially spaced, internally projecting means on said housing for securing said outer sleeve against axial displacement.

4,462,473

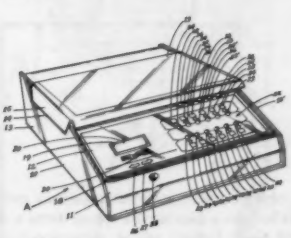
APPARATUS FOR ELECTRONICALLY DETERMINING POSTAGE IN RESPONSE TO WEIGHT

James C. Valestin, 718 Briar Farm La., Kirkwood, Mo. 63122

Filed Aug. 13, 1982, Ser. No. 407,832

Int. Cl.³ G01G *19/22, 13/14;* G06F *15/20*

U.S. Cl. 177—25 **15 Claims**

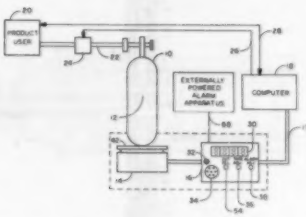


1. In combination, an electronic scale having weighing means and rate computing means for providing calculated weight and rate displays, and an encoded card-like rate selection and display device for providing combined front panel display and rate selection and readily and selectively usable with, and replaceable with respect to, said scale for causing said scale to provide calculated front panel weight and rate display only in accordance with predetermined encoding of said rate selection and display device, said scale having a front panel, said rate selection and display device being receivable upon said front panel and removable therefrom for changing, thereby to both the front panel display and rate selection to be changed simultaneously by changing of said rate selection and display device.

4,462,474
WEIGHT MONITORING APPARATUS

John J. Bordeaux, and John D. Miller, both of Sunnyvale, Calif., assignors to Digico, Sunnyvale, Calif.

Filed Jul. 27, 1982, Ser. No. 402,255
Int. Cl.³ G01G 23/36, 23/14, 3/14
U.S. Cl. 177—48 18 Claims



1. An apparatus for monitoring the weight of an article in relation to a selectable alarm weight, comprising:

scale means for providing a periodic gross weight signal having a magnitude which is indicative of the weight of the article;

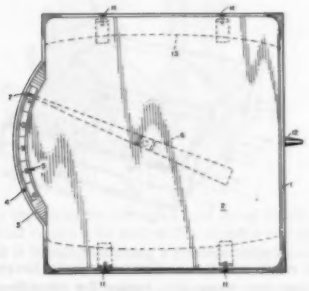
tare means responsive to the periodic gross weight signal for generating a conditioned weight signal having a steady state magnitude which is a selectable fraction of the periodic gross weight signal magnitude; and

alarm means responsive to the conditioned weight signal for generating an alarm indication whenever the magnitude of the conditioned weight signal is less than the selectable alarm weight.

4,462,475
WEIGHING SCALE

Walter P. Kushmuk, Niles, Ill., assignor to Continental Scale Corporation, Bridgeview, Ill.

Continuation-in-part of Ser. No. 057,906, Jul. 16, 1979, abandoned. This application Aug. 26, 1982, Ser. No. 411,654
Int. Cl.³ G01G 23/14, 21/28, 21/08
U.S. Cl. 177—173 5 Claims



1. A scale comprising:

(a) a base structure having a substantially horizontal bottom, upwardly extending sides and an open top,

(b) a weight responsive mechanism mounted in said base structure of (a) adapted to be activated by vertical movement caused by weight of an object placed on said scale, said mechanism adapted to translate said vertical movement to rotational movement of a vertical shaft mounted on said mechanism,

(c) a superstructure mounted over said base structure of (a) and supported for floating vertical movement by said weight responsive mechanism of (b), said superstructure comprising an upper surface to receive articles of substantial weight, substantially vertical sides, and a substantially horizontal lower surface, the lower side of said upper surface, said substantially vertical sides and said substantially horizontal lower surface forming a compartment of substantial width and depth sufficient to permit mounting of a pointer or dial disc adapted to extend to a side of said scale independently of said mechanism of (b),

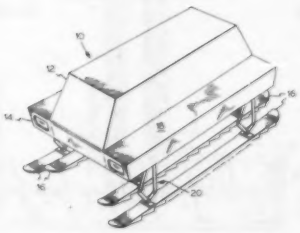
(d) said vertical shaft of (b) extending through said horizontal lower surface of said compartment of (c) and having a pointer or dial disc mounted therein for rotation in a substantially horizontal plane, the end of said pointer being inclined and the outer surface of said dial disc being inclined with indicia, and

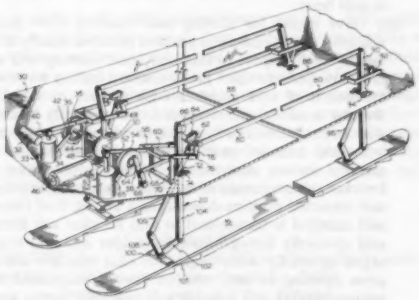
(e) a window in a side of said compartment of (c) through which the movement of said pointer or the indicia on said dial disc can be observed.

4,462,476
WALKING APPARATUS

Nikolay Shkolnik, 15F Woodland Ave., Bloomfield, Conn. 06002

Continuation-in-part of Ser. No. 252,903, Apr. 10, 1987, abandoned. This application Sep. 7, 1982, Ser. No. 415,386
Int. Cl.³ B62D 57/02
U.S. Cl. 180—8.6 21 Claims





1. In a walking device including a body, at least first and second feet adapted for resting on a support surface, and means for alternately supporting said body on one of said first and second feet while the supporting foot rests on the support surface, means operable to move said body relative to the supporting foot and to move the other foot relative to said body, the walking device being operable for walking motion in which said first foot rests on a support surface and supports said body as said second foot moves forward relative to said body and said body moves forward relative to said first foot and then said second foot rests on the support surface and supports said body as said first foot moves forward relative to said body and said body moves forward relative to said second foot, the improvement wherein:

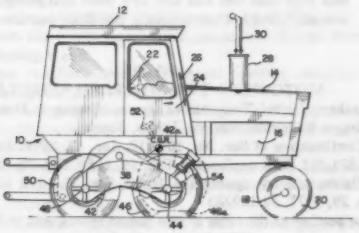
(a) said body includes a frame member,
(b) first and second principal pivot links pivotally mounted to said frame member about a principal point defining a principal pivot axis, said principal pivot links having ends extending above said principal pivot axis and having lower ends extending below said principal pivot axis,
(c) first and second principal connecting links pivotally connected at first ends thereof to the lower ends of said principal pivot links and pivotally connected at a mounting point defining a common axis on one of said feet,
(d) said first and second principal pivot links and said first and second principal connecting links comprising a principal linkage,
(e) an auxiliary pivot link,
(f) first and second auxiliary connecting links pivotally connected at one end thereof to said first and second principal pivot links above said principal pivot axis and pivotally connected together at their other ends and to one end of said auxiliary pivot link on an auxiliary pivot axis parallel to said principal pivot axis,
(g) said means for alternately supporting comprising a support and lifting means on said frame member pivotally connected to the other end of said auxiliary pivot link,
(h) a drive link pivotally connected at one end thereof to one of said principal pivot links above said frame member, and
(i) said means operable comprising a drive mechanism on said frame member operatively connected to said support and lifting means for raising and lowering said principal pivot links and said foot member through said first and second auxiliary connecting links and said auxiliary pivot link, said drive mechanism being connected to said drive link for horizontally moving said principal linkage and said foot member when said foot member is in a raised position, said drive mechanism being further effective to move said frame member when said foot member is on a supporting surface.

4,462,477

TRACTOR BOGIE SUSPENSION WITH STEERING AND WEIGHT TRANSFER CONTROL

James R. Mastro, Lemont, Ill., assignor to International Harvester Co., Chicago, Ill.

Filed Nov. 15, 1982, Ser. No. 441,970
Int. Cl.³ B60G *25/00*
U.S. Cl. 180—24.02 **10 Claims**



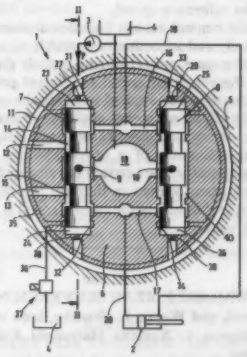
1. A front steered draft vehicle comprising an agricultural tractor including a load-deflected plow hitch, said tractor having rear bogie beams (40,42) each mid-mounted and including live-axle-connected leading and trailing bogie drive wheels (46,50);
weight re-distribution means to increase drive wheel traction including weight transfer rams (54) one for rocking each bogie beam to pivot the leading drive wheels (46) downwardly forcing the beams to assume at least a majority of the thus cantilevered front end weight of the tractor;
the mid-mounting of the bogie beams including transversely aligned beam pivots (36,38) so located on the tractor that the effective center of gravity (72) of the latter will fall behind the live axles of the leading bogie drive wheels (46) at least always when the vehicle is under draft loading;
means of operating the weight transfer rams comprising selective arm-operated (90) and manual (106,110) means;
said load-deflected hitch including drawbar draft links (122) and a load arm (80) connected thereto to deflect the hitch in sensitivity to the drawbar draft load; and
a load indicating arm (82) mechanically connected to the hitch and displaced thereby in accordance with sensitivity to the deflecting load;
said arm-operated means (90) of operating the weight transfer rams connected to the load indicating arm and effective in response to a predetermined load sensed in the draft links (122) to operate the rams forcing the leading bogie drive wheels downwardly as described.

4,462,478

SERVO STEERING

Armin Lang, Schwäbisch Gmünd, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,455
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122369
Int. Cl.³ B62D *5/08*
U.S. Cl. 180—143 **8 Claims**



1. In a servo steering system for motor vehicles, having a servo motor, a servo pump, a reservoir, a control valve and a control device connected to the control valve from which fluid is discharged to the reservoir at a restricted flow rate varied in dependence on vehicle speed, said control valve including at least one movable valve piston and at least two reaction chambers, the improvement comprising means for displacing the valve piston (7, 8, 7', 8', 7'') from a neutral position, a pair of fixed flow restrictors (28 and 30) respectively connected to and exclusively separating said two reaction chambers (24, 26, 24', 26', 24'', 26''), means for supplying pressurized fluid from the servo pump continuously through the respective flow restrictors to the reaction chambers, and valve passage means responsive to said displacement of the valve piston for alternatively connecting the reaction chambers to the control device (37), said valve passage means including a pair of control edges (32, 34, 32', 34', 32'', 34'') on the valve piston.

4,462,479

OVERSPEED ENGINE CONTROL

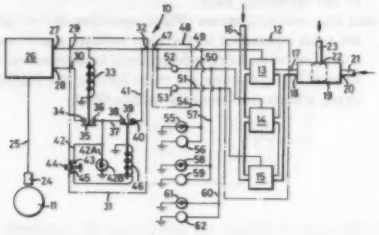
James Steel, Newcastle Upon Tyne, England, assignor to Ogden Electronics Ltd., Yorkshire, England

Filed Mar. 18, 1981, Ser. No. 245,206

Claims priority, application United Kingdom, Mar. 19, 1980, 8009242; Sep. 25, 1980, 8030902

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—171 **8 Claims**



1. Apparatus for controlling speed of an engine of a vehicle having brake retarding means, said apparatus comprising:

means for generating a first signal indicative of speed of the engine,

means for comparing said first signal with a signal representing a reference speed and for generating a second signal when the engine speed exceeds the reference speed, and

control means responsive to said second signal to control the brake retarding means of the vehicle so that, when the engine speed exceeds the reference speed, the engine speed is retarded by the brake retarding means to a level below the reference speed,

wherein said control means includes a plurality of devices successively and sequentially operable in accordance with length of a time period during which the engine speed exceeds the reference speed to control progressively the magnitude of power applied to the brake retarding means, a plurality of timing means each associated with a corresponding one of said devices and each adapted to be activated on activation of a corresponding device, and a manually operable reset switch to release the brake retarding means upon operation thereof, the said reset switch being inoperable unless the engine speed is below a predetermined value.

4,462,480

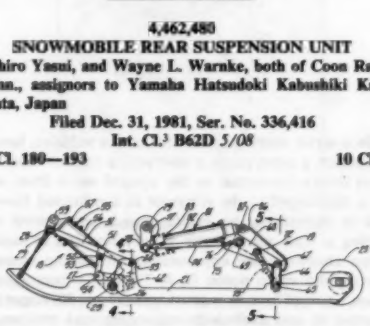
SNOWMOBILE REAR SUSPENSION UNIT

Toshihiro Yasui, and Wayne L. Warnke, both of Coon Rapids, Minn., assignors to Yamaha Hatsudoki Kabushiki Kaishi, Iwata, Japan

Filed Dec. 31, 1981, Ser. No. 336,416

Int. Cl.³ B62D *5/08*

U.S. Cl. 180—193 **10 Claims**



3. A suspension system for a vehicle such as a snowmobile or the like comprising a body and a ground engaging track or the like, said suspension system comprising a suspension element having a pair of relatively movable portions adapted to resiliently resist such relative movement, and means for operatively interposing such suspension element between said track or the like and said body for moving each of said portions of said suspension element in opposite senses relative to the other upon movement of said track of the element relative to the body comprising a bellcrank having an intermediate portion pivotally supported by the body and having opposite arms, a link pivotally connected to one of said bellcrank arms, a lever pivotally supported relative to said body, said link having a pivotal connection to said lever, one portion of said suspension element being pivotally connected to said lever and means for operatively connecting the other of said bellcrank arms to the other of said suspension element portions.

4,462,481

VEHICULAR FLOOR STRUCTURE

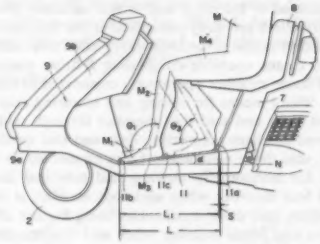
Katsuyoshi Kawasaki, and Jiro Miyata, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 410,925

Claims priority, application Japan, Aug. 26, 1981, 56-134680

Int. Cl.³ B62J *25/00*; B62K *5/04*

U.S. Cl. 180—215 **2 Claims**



1. A floor structure of a small-sized light vehicle having a substantially longitudinally flat low floor mounted between a front wheel and a driver's seat so as to permit a driver to position his feet on said floor, characterized in that:

said floor is inclined forwardly downward; and

said floor includes a rear end disposed relatively high at the lower portion of a seat post extending upwardly from the rear portion of said vehicle, and a front end disposed relatively low at the lower portion of a handle post extending upwardly from the front portion of said vehicle, said high rear end and said low front end being interconnected through a substantially flat floor portion.

4,462,482

MOTORIZED TWO-WHEELED VEHICLE

Masaharu Tsuboi, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 101,110, Jun. 11, 1979, Pat. No. 4,331,212. This application Feb. 19, 1982, Ser. No. 350,350

Claims priority, application Japan, Sep. 25, 1977, 52-143214; Sep. 29, 1977, 52-129232

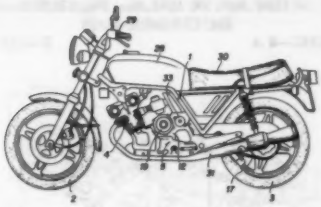
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ B60K *5/04*

U.S. Cl. 180—230 **5 Claims**

1. A motorized two-wheeled vehicle comprising a vehicle body frame having a front wheel and a rear wheel, an approximately vertically extending multiple-cylinder internal combustion engine positioned adjacent said front wheel and having a crankcase, and a bottom portion, a transmission positioned rearwardly of said engine and driven thereby, said transmission having an output shaft operatively coupled to drive said rear wheel and a casing formed integrally with said crankcase of said engine, a laterally extending crank shaft having a given width in the bottom portion of said engine and having a middle portion, a laterally extending input shaft on a front portion of

said transmission, a laterally extending intermediate shaft constituting a driving shaft for said input shaft incorporated between said crank shaft and said input shaft and located above said crank shaft, said intermediate shaft having end portions



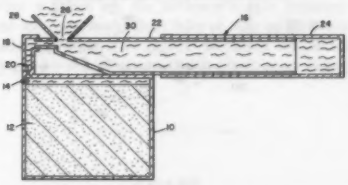
and a middle portion, power transmission means interconnecting said crank shaft and said intermediate shaft, and an A.C. generator provided on one end portion of said intermediate shaft, said intermediate shaft and said A.C. generator having a total length within the width of said crank shaft.

4,462,483

SOLID PROPELLANT SOUND GENERATOR FOR COAGULATION OF AEROSOLS

Robert E. Betts, Huntsville, and Lawrence B. Thorn, Madison, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1983, Ser. No. 510,710
Int. Cl.³ G10K *10/00*
U.S. Cl. 181—142 **4 Claims**



1. A solid propellant sound generator for coagulating aerosols comprising:

(a) a housing containing a solid propellant charge;

(b) means for igniting said solid propellant charge thereby producing a gas;

(c) a gas conduit connected to said housing adapted for receiving said gas;

(d) a nozzle rigidly fixed within said gas conduit adapted for converting said gas at a given pressure into one with a given velocity;

(e) a resonator connected to said gas conduit adapted to accept said gas and cause said gas to vibrate at said resonator's resonate frequency;

(f) gas exit means adapted to allow said vibrating gas to exit said resonator;

(g) calibration means for changing said resonant frequency whereby said vibrating gas produces a sound causing maximum coagulation within various identified aerosol environment, said calibration means being comprised of a first resonator housing connected to said gas conduit and a second resonator housing connected to said first resonator housing and adapted to move relative to said first resonator housing, said first resonator housing having calibration marks identifying the position of said second resonator housing for optimum coagulation in an identified aerosol; and,

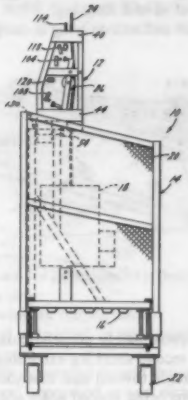
(h) amplifing means connected to said gas exit means for amplifing and directing said sound.

4,462,484

TENSION SENSING DEVICE

Richard E. Crudele, Farmington Hills, Mich., assignor to Platforms and Power, Inc., Livonia, Mich.

Filed Sep. 3, 1981, Ser. No. 298,947
Int. Cl.³ E04G *3/10*
U.S. Cl. 182—19 **13 Claims**



1. In a scaffold suspended by at least one hoist cable, a tension sensing device for detecting an under or over-tensioned cable condition, comprising:

a support structure adapted to be secured to said scaffold and having guide means for directing said hoist cable through said device;

lever arm means for sensing the tension on said hoist cable, including a generally vertically disposed lever arm member pivotally mounted to said support structure for pivotal movement in response to a variation in the tension of said hoist cable, a sheave rotatably mounted to said lever arm member, and spring means for biasing said sheave into engagement with said hoist cable; and

switch means for detecting said under-tensioned cable condition in response to a first predetermined pivotal movement of said lever arm member and for detecting said over-tensioned cable condition in response to a second predetermined pivotal movement of said lever arm member in the opposite direction of said first predetermined pivotal movement.

4,462,485

LADDERS FOR TRANSOMS OF BOATS

John L. Terry, and Robert G. Ritten, both of Ft. Pierce, Fla., assignors to Step-On Inc., Ft. Pierce, Fla.

Filed Jan. 17, 1983, Ser. No. 458,527
Int. Cl.³ B63B *29/20*
U.S. Cl. 182—84 **10 Claims**

1. A ladder for the transom of a boat which comprises:

a pair of brackets adapted to be fastened to the transom of a boat,

a first quadrangular tubular member defined by a top section, a bottom section, a first side section and a second side section, said side sections being shorter than said top and bottom sections,

said tubular member being hinged to one of said brackets at about the corner where said top section joins said first side section,

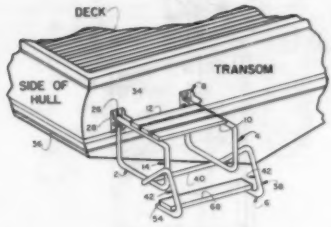
a second quadrangular tubular member similar to said first spaced apart from said first member and similarly hinged to the second of said brackets,

planking fixed to said top sections of said tubular members spanning the space between them,

a third tubular member defined by a central section and two parallel end sections integral with said central section disposed in planes substantially perpendicular to said central section,

said end sections being substantially identical and comprising a first short leg joined at one end to said central section, a long leg joined at one end to the other end of said first short leg and a second short leg joined at one end to the other end of said long leg,

said legs of each end section lying in one plane with said long



leg being approximately perpendicular to said first short leg and said second short leg extending from said long leg at an acute angle toward said first short leg,

said end sections being spaced apart approximately the distance between the outboard sides of said first and second tubular members and being hinged to said second side sections of the tubular members adjacent the corner where said second side section joins said bottom section thereof, and

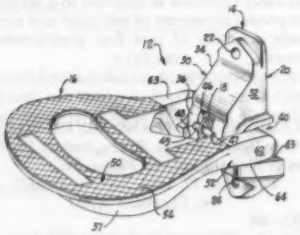
planking fixed to said second short legs of said end sections spanning the distance between them.

4,462,486

FOLDING FOOT STEP

Donald J. Dignan, South Euclid, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Jan. 7, 1983, Ser. No. 456,361
Int. Cl.³ B60R *3/02*
U.S. Cl. 182—91 **9 Claims**



1. A step apparatus comprising:

a bracket;

a step member;

a pivotal interconnection between the bracket and step member;

a spring connected between the bracket and step member urging the two together under force at the pivotal interconnection; and

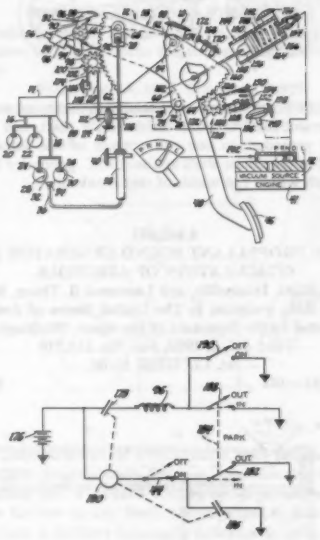
a cam surface carried by the step member, continuously acting against the bracket under the force of said spring, and shaped to increase the spring force during pivoting of the step member relative to the bracket from both a folded and extended position.

4,462,487

COMBINED VEHICLE SERVICE AND PARKING BRAKE CONTROL MECHANISM

Edward H. Warwick, Englewood; Donald L. Parker, Middletown, and Ralph J. Kaup, Germantown, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 29, 1982, Ser. No. 372,940
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—4 A **8 Claims**



1. A single pedal arm service brake and parking brake operating mechanism for a vehicle having a service brake and a parking brake, said mechanism comprising:

a single brake pedal arm pivotally mounted for brake actuating and release movements,

a sector pivotally mounted to selectively pivot with and allow pivotal movement of said brake pedal arm relative to said sector, said sector having a parking brake actuator operatively attached thereto, said sector being selectively pivotally movable in a brake actuating direction with and in response to at least a component of brake actuating pivotal movement of said brake pedal arm to activate said parking brake actuator and operate the vehicle parking brake;

a service brake actuator activated by at least a component of brake actuating pivotal movement of said brake pedal arm to operate the vehicle service brake,

first means selectively permitting and preventing brake releasing pivotal movement of said sector during and following pedal arm brake release movement, said first means including a selectively energizable servomotor;

and second means under control of and operated by the vehicle operator, said second means controlling energization and deenergization of said servomotor to operatively hold and release the parking brake after the parking brake has been actuated by arcuate movement of said brake pedal arm and said sector.

4,462,488

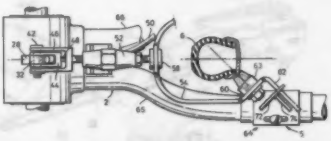
BICYCLE BRAKE

Winnett Boyd, 32 Restwell Crescent, Willowdale, Ontario, Canada M2K 2A3

Continuation-in-part of Ser. No. 078,249, Sep. 24, 1979, abandoned. This application Sep. 16, 1981, Ser. No. 302,537

Int. Cl.³ B62L 5/00

U.S. Cl. 192—5 16 Claims



1. A bicycle including a frame, a pedal crankshaft journalled in the frame, a chain drive connecting the pedal crankshaft to a rear wheel, a back pedal brake system comprising a rear wheel brake supported by the frame, a progressive brake actuator connected to the brake and means establishing an operative coupling between the pedal crankshaft and the brake actuator, bidirectional lost motion means incorporated into the chain drive independent of said coupling means, the degree of lost motion being such as to allow sufficient forward motion of the cranksahft independent of the rear wheel to permit full and mormal release of the brake whilst maintaining establishment of said coupling, and means biasing the lost motion means to a condition in which the rearward lost motion is taken up and said forward lost motion is available, said biasing means being a spring providing a highly progressive bias as said forward lost motion is taken up, the forward torque required to be applied to the pedal crankshaft fully to take up said bias being a substantial porportion of normal pedalling torque and substantially greater than that required to commence taking up the bias.

4,462,489

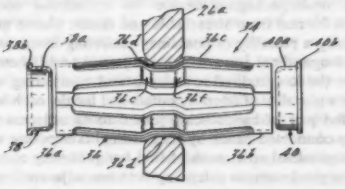
SYNCHRONIZER SPRING PIN

Timothy J. Morscheck, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 31, 1981, Ser. No. 288,723

Int. Cl.³ F16D 11/00, 13/00, 3/38

U.S. Cl. 192—53 E 5 Claims



1. A spring comprising:

a spring pin having first and second ends joined together by at least two beam springs disposed radially outward of and generally parallel to the longitudinal axis of the pin, said beams bowed radially outward from each other in barrel stave fashion and pinched radially inward toward each other at a position between said ends to define a detent groove concentric to said axis; and

means for preventing radial flexing of said first and second ends.

4,462,490

CONTROL SYSTEM FOR OPERATION OF FLUID TORQUE CONVERTER FOR VEHICLES

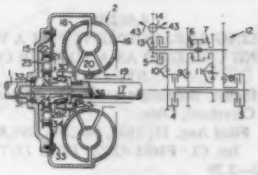
Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 325,764

Claims priority, application Japan, Nov. 29, 1980, 55-168525

Int. Cl.³ B60K 41/02; F16D 25/02, 41/08

U.S. Cl. 192—0.076 6 Claims



1. A control system for operation of a fluid torque converter for vehicles comprising:

(a) an engine having an output shaft;

(b) a pump wheel connected to said output shaft;

(c) a driving wheel;

(d) a turbine shaft connected to said driving wheel;

(e) a turbine wheel connected to said turbine shaft;

(f) a fluid for transmission of power between said pump wheel and said turbine wheel; and

(g) a one-way clutch means coupled between said output shaft and said turbine shaft for connecting and disconnecting said shafts to and from each other, said one-way clutch means, when engaged, directly connecting said output shaft and said turbine shaft to transmit power from said output shaft to said turbine shaft, said one-way clutch means including:

a driving member connected to said output shaft and provided with a conical, driving outer circumferential surface,

a driven member connected to said turbine shaft and provided with a conical, driven inner circumferential surface opposed to said conical driving surface,

wedge rollers provided between said driving and driven members, and

means associated with said driving member for engaging and disengaging said driving and driven members with and from each other in response to hydraulic pressure applied thereto.

4,462,491

APPARATUS FOR CONTROLLING A DRIVING FORCE APPLIED TO A COMPRESSOR

Hiroya Kono; Jun Hasegawa, both of Kariya; Mitsukane Inagaki, Anjo, and Hisao Kobayashi, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; Toyota Jidosha Kabushiki Kaisha and Nippondenso Co., Ltd., all of Aichi, Japan

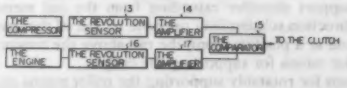
Filed Jul. 29, 1981, Ser. No. 287,876

Claims priority, application Japan, Aug. 9, 1980, 55-109486

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.³ F04B 49/02, 49/06; F16D 43/24

U.S. Cl. 192—84 R 4 Claims



1. An apparatus for controlling a driving force transmitted

from a vehicle engine, via an electromagnetic clutch, to a compressor of a vehicle air-conditioning equipment, comprising:

sensor means for detecting the revolving rates of said compressor and said engine, and

control means for providing a signal to disengage said electromagnetic clutch when the revolving rate of said compressor detected by said sensor means is reduced below a value corresponding to the revolving rate of said engine.

4,462,492

COOLING ARRANGEMENT FOR A VISCOUS COUPLING UTILIZED AS A TORQUE CONVERTER BYPASS

Robert S. Mueller, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 11, 1981, Ser. No. 291,876

Int. Cl.³ F16H *45/02*; F16D *13/72*

U.S. Cl. 192—3.29 **11 Claims**

1. An apparatus comprising:

A. a housing for containing a liquid;

B. means defining a partition dividing said housing into first and second liquid chambers sealed from each other by said partition, said partition having a generally planar configuration and including a first surface area on one side thereof in wetting juxtaposition to the liquid in said first liquid chamber and a second surface area on the other side thereof in wetting juxtaposition to the liquid in said second liquid chamber; and

C. means defining an elongated narrow passage extending circuitously through said partition and having a single entrance at one end opening in said first surface area and a single exit at its other end opening in said second surface area, said passage being defined between its entrance and exit by a single continuous imperforate wall surface and having an effective length at least several times greater than the effective distance between said surfaces, to provide a long and narrow, but large surface area, flow path between said chambers to provide a rate of liquid flow through said passage between said chambers that varies significantly with variations in the viscosity, and thereby the temperature, of the liquid.

4,462,493

ROLLER RAIL ASSEMBLY FOR CARGO LOADING SYSTEM

Arnold B. Nordstrom, Torrance, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Sep. 29, 1982, Ser. No. 426,743

Int. Cl.³ B65G *13/11*

U.S. Cl. 193—35 R **7 Claims**

1. A roller rail assembly for use in loading cargo into a vehicle, said rail assembly being removably mounted in a track having alternate lip and cutout portions on opposite sides thereof comprising

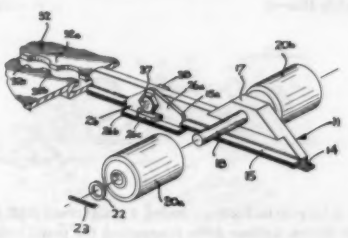
a rail member having a tension stud extending substantially normally therefrom along the bottom edge thereof and a support shoulder extending from the rail member in a direction substantially opposite to that of the tension stud and at a position along the rail above the tension stud,

roller means for supporting the cargo,

means for rotatably supporting the roller means on said rail member, and

retainer means for retaining the rail member in said track comprising a main body portion, a tension lug and a shear lug extending normally from the body portion in substantially the same direction,

the tension stud of the rail member being fitted in the track under the lip portions thereof on one side of the track with the support shoulder of the rail member running along the



track above the lip portions on the other side thereof, the tension lug of the retainer means being installed under predetermined areas of the lip portions on the other side of the track with the shear lug installed in one of the cutout portions on the other side of the track, and

means for removably attaching the main body portion of the retainer means to the rail member.

4,462,494

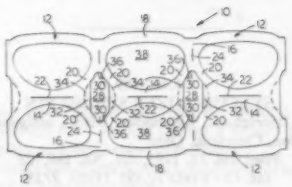
MULTI-PACKAGING DEVICE FOR CYLINDRICAL CONTAINERS

Ernest R. Cunningham, Libertyville, Ill., assignor to Grip-Pak, Inc., St. Louis, Mo.

Filed Jan. 24, 1983, Ser. No. 460,139

Int. Cl.³ B65D *71/00*

U.S. Cl. 206—150 **7 Claims**



1. A multi-packaging device for cylindrical containers which is formed from stretchable and elastic plastic material, comprising a plurality of container encircling bands arranged in two longitudinal rows which are joined to adjacent bands between the longitudinal rows by lateral connecting webs to provide a plurality of laterally connected bands, each laterally connected pair of bands being joined to an adjacent pair of laterally connected bands by longitudinal connecting webs in each longitudinal row, each of said bands having curvilinear inner marginal sections extending between adjacent longitudinal connecting webs and lateral connecting webs, adjacent pairs of laterally connected bands having finger openings therebetween defined by adjacent curvilinear inner marginal sections, longitudinal connecting webs and lateral connecting webs of adjacent pairs of laterally connected bands, each laterally connected pair of bands having a pair of transversely extending finger tab means which include integral outer marginal portions of an associated lateral connecting web that extend between curvilinear inner marginal sections of said laterally connected bands on each side of said associated lateral connecting web, said finger tab means each including a curvilinear weakened area formed in the laterally connecting web

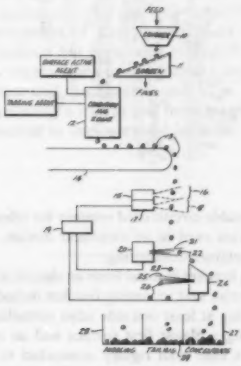
inside of the outer marginal portions of the transversely extending finger tab means which comprises a reversely curving weakened line extension of the curvilinear inner marginal sections of each pair of laterally connected bands on each side of an associated lateral connecting web, whereby to provide readily deflectable finger tab means for gripping thereof by a user when the multi-packaging device is assembled to a plurality of containers.

4,462,495

PROCESS AND APPARATUS FOR THE SEPARATION OF PARTICLES INTO THREE FRACTIONS OF SIMILAR COMPOSITIONS

John R. McKinley, Claremont, and John G. Roeschlaub, Upland, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.

Filed Jun. 4, 1979, Ser. No. 45,185
Int. Cl.³ B07C 5/02
U.S. Cl. 209—3.3 4 Claims



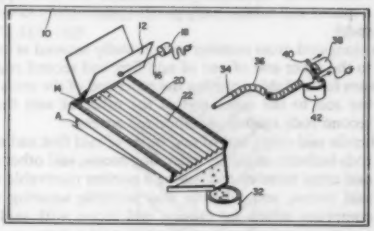
1. In a process for the separation of higher-grade limestone from lower-grade limestone and the gangue present in particulate limestone ore by the steps of conditioning the particulate limestone ore with at least one surface-active agent selected from saturated and unsaturated carboxylic acids containing from about 4 to about 22 carbon atoms, said surface-active agent selectively coating the calcium carbonate in the limestone ore to the substantial exclusion of coating gangue in combination with providing at least one fluorescent dye to said surface-active agent, irradiating the conditioned particulate limestone ore to excite and induce fluorescence of the fluorescent dye and separating the ore particles into a first fraction of fluorescing coated higher-grade limestone particles and a second fraction of coated lower-grade limestone and non-fluorescing gangue particles, the improvement comprising the step of separating the limestone particles into three fractions each of similar concentration of calcium carbonate by distinguishing among the intensities of fluorescence of the provided fluorescent dye on the particles with a first fraction comprising particles exhibiting a relatively high intensity of fluorescence, a second fraction comprising particles exhibiting a relative intensity of fluorescence lower than particles in the first fraction and a third fraction comprising particles exhibiting a relative intensity of fluorescence lower than particles in the second fraction.

4,462,496

METHOD AND APPARATUS FOR SEPARATING SPHERES FROM NON-SPHERES

Duane Stafford, Champaign, Ill., assignor to APL Anderson, Inc., Urbana, Ill.

Filed Apr. 5, 1983, Ser. No. 482,061
Int. Cl.³ B07C 7/04
U.S. Cl. 209—643 13 Claims



2. Apparatus for separating the spheres from the non-spheres in a large number of particles of lamp fill material of substantially equal mass comprising:

a dry box;

a hopper within said dry box;

a generally planar surface within said dry box, said surface having a plurality of parallel grooves,

each of said grooves being uniform over the length thereto and open at the upper extremity thereof a distance between about 100 percent and 150 percent of particle diameter and configured to limit the contact of grooves with a particle placed therein to a relative small area intermediate the top and bottom of said groove,

said surface being disposed at an angle to the horizontal between about one degree and fifteen degrees with the upper end thereof underlying said hopper so that particles exiting said hopper will be deposited on said surface in position to roll down one of said grooves under the influence of gravity; and

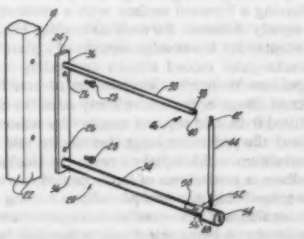
vacuum pick-up means within said dry box, said means including a manually positionable nozzle whereby particles which do not roll the length of said grooves may be selectively removed from said surface by the manual positioning of the free end of said nozzle in proximity thereto.

4,462,497

DISPLAY STAND

Warren E. Maule, 345 Ford Ave., Highland Park, Mich. 48203

Filed Oct. 26, 1981, Ser. No. 315,014
Int. Cl.³ A47F 5/04
U.S. Cl. 211—7 13 Claims



1. A display stand comprising:

an elongated support and means for mounting said support

to a ground surface so that said support extends generally vertically,

at least one locking assembly secured to said support, each locking assembly comprising:

a first elongated rod, said first rod having one end secured to said support so that said first rod extends substantially horizontally outwardly from said support,

a second elongated rod, said second rod having one end secured to said support so that said second rod extends substantially horizontally outwardly from said support in a spaced and substantially parallel relationship to said first rod,

an elongated cross member rod pivotally secured at one end to the other end of one of said first and second rods,

means for lockably securing the other end of the cross member rod to the other end of the other of said first and second rods against unauthorized access,

wherein said other end of said other of said first and second rods includes an axially extending recess, said other end of said cross member rod having a portion receivable within said recess, and wherein said lockable securing means comprises means for closing said recess with said cross member portion positioned within said recess.

4,462,498

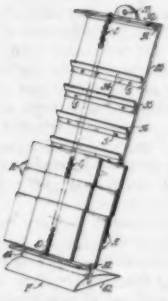
SELF INDEXED RECORD ALBUM RACK

Fred Walker, Jr., 745 W. Colden Ave., Los Angeles, Calif. 90044

Filed Jul. 9, 1981, Ser. No. 281,881

Int. Cl.³ A47F 7/00

U.S. Cl. 211—40 **6 Claims**



1. A record album rack adapted for functional location in alternate vertical and backtilted positions when holding a plurality of individually withdrawable, upstanding, generally rectangular, laterally overlapping, edge-supported record albums arranged in cross rows formed by forward projecting, transverse ledges and thus disposed against a forward surface of the rack, each album having substantially planar obverse and reverse faces, said rack comprising

an upstanding, elongated, generally planar, support member having a forward surface with a vertical series of transversely directed, forward extending ledges individually adapted for lower-edge support of a plurality of generally rectangular record albums upstanding in a semi-display position thereupon wherein the reverse face of each record album is disposed closely adjacent and slightly outtilted from said support member by reason of line contact with the proximate ledge thereabove, said ledges having a minimum width equal to twice the thickness of a record album, a central one of a row of said record albums along a ledge being disposed partially overlying a laterally adjacent album of a row and each record album of a ledge-supported row being selectively removable by endwise withdrawal from the respective ledge, and

a generally linear, restraining member fixedly terminally secured adjacent upper and lower margins of the support member and disposed generally vertically, spacedly overlying the forward surfac of the support member and thus positioned to restrainingly contact an upper edge portion of the obverse face of a central record album of each ledge, thereby retaining the collective record albums of each ledge from undesired forward displacement from the rack.

4,462,499

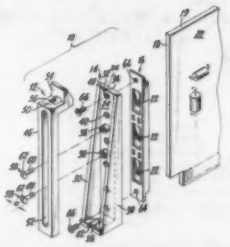
ADJUSTABLE CIRCUIT CARD RETAINER

Anthony D. Calabro, 8738 West Chester Pike, Upper Darby, Pa. 19082

Filed Aug. 16, 1982, Ser. No. 408,151

Int. Cl.³ H02B 1/02

U.S. Cl. 211—41 **15 Claims**



1. An adjustable circuit card retainer for releasably retaining a printed circuit card in an electrical device, said adjustable circuit card retainer comprising:

a mounting bracket formed from an electrically non-conductive material, said mounting bracket including a mounting wall having at least one side edge extending between and connecting a planar first surface and an opposed second surface, a base wall rigidly connected to and extending from said mounting wall perpendicular to the first surface thereof, and at least one boss extending from said first surface of said mounting wall;

a card retaining bracket formed from an electrically non-conductive material, said card retaining bracket including an elongated rectangular mounting leg having a planar first surface and an opposed second surface, said mounting leg including an elongated slot extending through said mounting leg from the first to the second surfaces thereof, said card retaining bracket further including a card retaining leg connected to and extending perpendicularly from said first surface of said mounting leg and including a card receiving notch, said first surfaces of said mounting and card receiving brackets respectively being in face to face slidable contact such that said boss extends through and is slidable in said slot and such that said card retaining leg extends across one said edge of said mounting wall; and

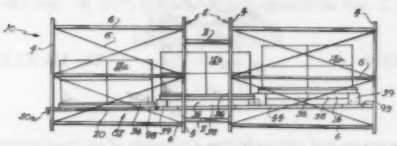
at least one fastener releasably securing said card retaining bracket to said mounting bracket whereby when the mounting bracket is mounted in the electrical device, said card retaining bracket may be slidably moved with respect to said mounting bracket such that said card receiving notch engages the circuit card, thereby enabling said fastener to secure said card retaining bracket to said mounting bracket to securely retain the circuit card in the electrical device.

4,462,500

MULTIPLE LOCATION STORAGE BAYS

Anthony N. Konstant, Winnetka, and John J. Weider, Arlington Heights, both of Ill., assignors to Speedrack, Inc., Skokie, Ill.

Filed May 19, 1982, Ser. No. 379,638
Int. Cl.³ A47F 5/00
U.S. Cl. 211—151 11 Claims



1. In a storage rack having bays for receiving at least two loads in a front location and at least one location rearward thereof, each bay comprising:

an open front end through which loads may be supplied and withdrawn,

rail means extending from said front location to said rearward location and being inclined downwardly towards said front end,

trolley means for carrying a load, said trolley means being mounted on said rail means for movement therealong,

catch means associated with said rail means for preventing forward movement of said trolley means when in said rearward location but permitting rearward movement of said trolley means when in said forward location,

means to release said catch means, and

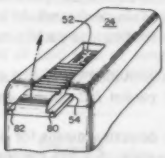
means for supporting a load at said front location when said trolley is moved to said rearward location.

4,462,501

CHILD PROOF MEDICINE VIAL

Roberto D. Franchi, 167 Pequot Ter., Stonington, Conn.-06378

Filed Jun. 28, 1983, Ser. No. 508,753
Int. Cl.³ B65D 55/02, 85/56; A61J 1/00
U.S. Cl. 215—296 15 Claims



1. A medicine container comprising:

side walls and end walls having rounded corners;

a bead extending circumferentially of the inside of said walls near the open end thereof;

a cap having a depending flange with a groove therein for mating with said bead; and

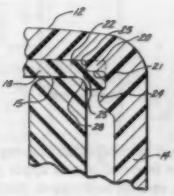
a slidable panel in the cap which, when retracted, aids in facilitating removal of the cap from the container.

4,462,502

THREADED CLOSURE WITH LINER

Werner R. Luenser, Blue Island, and Efrem M. Ostrowsky, Highland Park, both of Ill., assignors to Ethyl Molded Products Company, Richmond, Va.

Continuation-in-part of Ser. No. 379,065, May 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 271,781, Jun. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 218,735, Dec. 22, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,746
Int. Cl.³ B65D 53/04
U.S. Cl. 215—329 51 Claims



1. A thermoplastic closure for fitment to a container having a threaded neck terminating in a lip which defines an open mouth, said closure comprising:

a. a circular top wall;

b. an annular skirt downwardly depending from said top wall, said skirt having about its inside surface a closure thread for cooperation with said neck thread to achieve said fitment;

c. a circular, flexible, resilient ethylene-vinyl acetate copolymer liner positioned adjacent said top wall and having a diameter greater than the outside diameter of said lip said ethylene-vinyl acetate copolymer liner additionally containing a slip additive to improve the lubricity characteristics of said liner; and

d. annular means for pressing said liner around the outside edge of said lip to form a gas-tight seal when said closure is fitted on said container, said annular means being located adjacent the inside intersection of said top wall and said skirt, and being configured to increase the fidelity of said gas-tight seal when said circular top wall is flexed upwardly.

4,462,503

BEVERAGE CONTAINER WITH ENCLOSED STRAW

Rudolph Di Raffaele, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, c/o Rudolph Di Raffaele, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Aug. 18, 1982, Ser. No. 409,159
Int. Cl.³ A47G 19/22
U.S. Cl. 220—90.2 2 Claims

1. A container with pull-up straw which comprises:

(a) a beverage can;

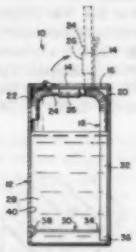
(b) a pull tab hingably affixed to top of said beverage can;

(c) a straw having two flexible sections in upper portion of said straw; and

(d) a clamp affixed to underside of said pull tab and between said two flexible sections in said upper portion of said straw whereby said upper portion of said straw bends around said top of said beverage can so that when said pull tab is pulled said upper portion of said straw will come out of said beverage can, further comprising a means for holding a lower portion of said straw in a fixed position within said beverage can wherein said means for holding lower portion of said straw in a fixed position within said beverage can is a retainer having one end affixed perpendicular to a free end of said lower portion of said straw and an other forked end engaging the wall of said bever-

age can so that said lower portion of said straw will not move, providing

a spring stiffener affixed to end of said clamp so that when said pull tab is pulled said upper portion of said straw will



come out of said beverage can causing said spring stiffener to press against free end of said upper portion of said straw until said free end of said upper portion of said straw is straight.

4,462,504

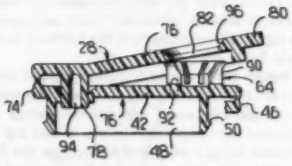
TAMPER-INDICATING CLOSURE

Donald J. Roth, Westport; Charles S. Kubis, Weston, both of Conn., and John Walter, Evergreen Park, Ill., assignors to Continental Packaging Company, Inc., Stamford, Conn.

Filed May 23, 1983, Ser. No. 497,308

Int. Cl.³ B65D *55/02*

U.S. Cl. 220—214 **9 Claims**



1. In a closure of the type which includes a closure member for effecting a seal, a vent opening through said closure member, a lever member connected to said closure member along a hinge line for moving the same to an open position, and said lever member carrying a plug receivable in said vent opening to close the same; a tamper indicating means including a rivet carried by said closure member and said lever member having an opening therethrough receiving said rivet, said rivet being hollow and having a radially outwardly flared resilient end portion which is radially inwardly deformable to release said lever member.

4,462,505

RESEALABLE TAMPER-PROOF CLOSURES

Joseph R. Paradis, 60 Plymouth Rd., Holden, Mass. 01520

Filed Nov. 15, 1982, Ser. No. 441,557

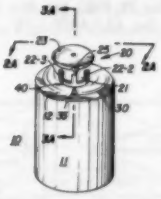
Int. Cl.³ B65D *41/02, 41/32*

U.S. Cl. 220—266 **10 Claims**

1. A tamper-proof closure comprising

a cap that is integrally connected to a housing by a seal; said cap having a body portion that extends above the level of said seal to provide a distinct visual indication that the connection of the cap to the housing has not been disturbed; a flange on said cap to facilitate the rupture of the seal connecting said cap to said housing providing a distinct visual indication of when the connection of the cap to the housing has been disturbed;

means for permitting the removal of said cap from said housing and the repositioning of said cap on said housing only when said cap and said housing have a prescribed orientation relative to one another; and



means on said cap including a plurality of inclined ramps on its body portion for locking said cap to said housing after the seal between the two is broken.

4,462,506

BILL PACKET DISCHARGING APPARATUS

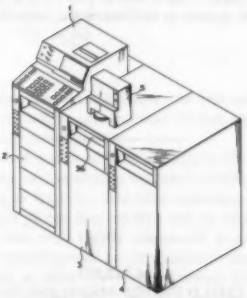
Hiroshi Ohba, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 16, 1982, Ser. No. 408,277

Claims priority, application Japan, Aug. 18, 1981, 56-129527

Int. Cl.³ B65H *43/08*

U.S. Cl. 221—13 **10 Claims**



1. A bill packet discharging apparatus comprising:

bill packet feeder means provided in the proximity of bill packet storage means accommodating a number of bill packets stored in a stack, each of said bill packets comprising a plurality of single sheets held together by a band, for automatically feeding out packets one after another to a transport path;

transport means provided on said transport path for transporting a bill packet fed out by said bill packet feeding means;

bill packet state detecting means for detecting in said transport path the state of a bill packet fed out by said bill packet feeding means;

switching means for switching the direction of said transport path to one of a direction leading to a discharging section and a direction leading to a recovery section according to a bill packet state signal provided from said bill packet state detecting means; and

second transport means controlled by said switching means to switch the transport path direction to the direction leading to said discharging section to transport a transferred bill packet to said discharging section.

4,462,507

DISPENSING CLOSURE FOR CLOSING A CANISTER CONTAINING DISPENSABLE ARTICLES

Herman Margulies, South Orange, N.J., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 341,346, Jan. 21, 1982, abandoned, which is a continuation of Ser. No. 137,751, Apr. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 33,411, Apr. 26, 1979, abandoned. This application Apr. 2, 1982, Ser. No. 364,646

Int. Cl.³ A47K *10/24*

U.S. Cl. 221—63 66 Claims

1. A package comprising:

a canister having an open end and containing a web of towels which are separably connected by performations; and

a dispensing closure for closing said open end of said canister and for dispensing therefrom said towels individually, said closure comprising:

a top fitting over said open end of said canister, said top having depending therefrom an integral peripheral axial flange fitting and positioning said top on said canister;

said top having therein a dispensing opening and a slit connected with said dispensing opening;

a lid selectively movable between a first position covering at least a portion of said top and a second position removed from said top;

said lid including a first portion adapted to cover said dispensing opening when said lid is in said first position thereof, said lid including a second portion adapted to cover said slit when said lid is in said first position thereof, and said second portion of said lid being integrally but flexibly connected to said first portion of said lid, such that when said lid is in said first position thereof said second portion of said lid is selectively pivotable with respect to said first portion of said lid away from said top thereby to uncover said slit; and

said dispensing opening having a size sufficient to enable fingers of a consumer to extend through said dispensing opening to grasp a first towel of said web of towels and to then pull such first towel toward and into said slit, and said slit having a size and shape such that, upon pulling a towel outwardly of said canister through said slit, side edges of said slit apply sufficient tension on the towel being pulled through the slit to allow separation of such towel from a succeeding towel of said web of towels, whereby such succeeding towel will then be partially extended through said slit.

4,462,508

APPARATUS FOR ALIGNING AND FEEDING ELONGATED OBJECTS

Gerald R. Grafius, Erie, Pa., assignor to Swanson Systems, Inc., Erie, Pa.

Filed Jul. 29, 1981, Ser. No. 288,038

Int. Cl.³ B65G *47/14*

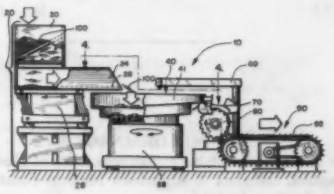
U.S. Cl. 221—201 19 Claims

1. A system for sorting and sequentially feeding elongated objects with coaxial leads, wherein random leads within disordered clumps of the objects may be bent and entangled, comprising:

hopper means for disentangling clumps of entangled elongated objects with coaxial leads;

vibrating bowl means, including a base portion, a side wall, and a ramp spiralling along the inner perimeter of the side wall between the base portion and its output end, for receiving disentangled objects from the hopper means and conveying the objects along the upper surface of the ramp from the base portion to the output end;

means positioned along the ramp for limiting the number of



objects conveyed along the ramp in a side-by-side relationship;

selection means positioned along the ramp for removing from the ramp surface objects with leads bent beyond a predetermined angular degree; and

chute means curved and having an upper end mounted on the vibrating bowl means adjacent the output end of the ramp for receiving objects exiting the ramp and sequentially feeding them in downward direction to a lower end of the chute means while maintaining a lateral orientation.

4,462,509

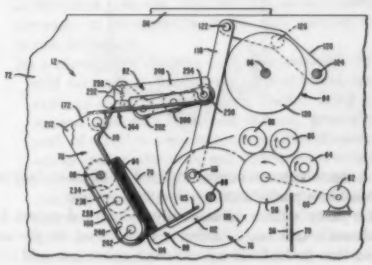
CURRENCY STACKER AND PRESENTER

Donald L. Adelberger, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 9, 1982, Ser. No. 447,930

Int. Cl.³ B65G *60/00*

U.S. Cl. 221—259 8 Claims



1. A document stacker and presenter comprising:

a frame;

a presenter unit pivotally mounted in said frame;

first moving means for moving said presenter unit between first and second positions in said frame;

receiving means for receiving documents to be stacked, including a rotating stacker wheel;

a stripper yoke pivotally mounted in said frame, and second moving means for moving said stripper yoke between first and second positions;

said stripper yoke when in said first position cooperating with said presenter unit when said presenter unit is also in said first position to form a stack of documents as they are received from said stacker wheel;

said presenter unit also connected to a pressure plate;

third moving means for moving said pressure plate between

an open position and a capture position in which said capture position said stack of documents is retained on said presenter unit by said pressure plate;

said presenter unit also having means for feeding said stack between said presenter unit and said pressure plate when said pressure plate is in said capture position to deposit said stack of documents in a reject bin when said presenter unit is in said first position and to deposit said stack of documents in a customer access area when said presenter unit is in said second position.

4,462,510

TAP FOR DRAINAGE BAG

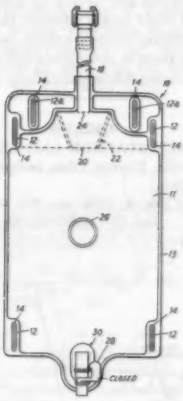
Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Kingsdown Medical Consultants Limited, London, England

Filed Jun. 24, 1982, Ser. No. 391,658

Claims priority, application United Kingdom, Jun. 30, 1981, 8138193

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—48 **12 Claims**



1. A tap which can be readily fixed in a face-to-face manner to a wall of a plastic drainage bag comprising:

(a) a body with a substantially cylindrical recess formed therein, said body having a rib located on the exterior surface thereof and a port which opens into said cylindrical recess;

(b) a substantially cylindrical valve member in the form of a substantially hollow tube open at one end and having a port through a side wall thereof, said valve member having a deformable handle positioned thereon, said valve member being held within said recess in said body by engagement of said deformable handle with said rib, whereby said valve member is insertable and rotatable in said cylindrical recess of said body;

(c) a flange on said body, whereby said body may be secured to a wall of said drainage bag, said port in said body extending through said flange, whereby at one rotational position of said valve member relative to said body, said port in said valve member registers with said port in said body, thereby opening said valve and providing a flow passage from said flange, through said ports, and out said open end of said valve member.

4,462,511

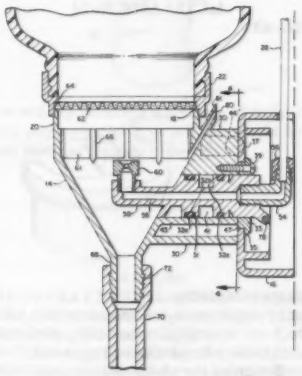
DISSOLVING AND DISPENSING APPARATUS

Frederick J. Fulmer, Lehighton, and George Moschak, Palmerton, both of Pa., assignors to Viking Injector Company, Lehighton, Pa.

Continuation of Ser. No. 187,432, Sep. 15, 1980, abandoned. This application Sep. 21, 1983, Ser. No. 534,942

Int. Cl.³ B67D *5/32*

U.S. Cl. 222—52 **35 Claims**



1. Material dispensing apparatus for dispensing a solution of said material comprising:

(a) a container of said material formed of a component which enables external observation of a level of said material within said container;

(b) said container having an opening;

(c) conveying means having coupling means for coupling a first opening to said conveying means to said opening of said container;

(d) receiving means attached to said conveying means for receiving granules of said materials fed from said container;

(e) dissolving means comprising a nozzle for directing a liquid at said receiving means to form a solution;

(f) said conveying means having a second opening therein for dispensing said solution; and

(g) rotating means for rotating said container and said conveying means from a first position wherein granules of said material may be fed from said container to said receiving means, to a second position wherein granules of said material may not be fed from said container to said receiving means.

4,462,512

CHANGE MAKING SYSTEM

James T. Schuller, St. Louis, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Sep. 24, 1982, Ser. No. 422,959

Int. Cl.³ G07F *9/08*

U.S. Cl. 194—1 N **14 Claims**

1. A change making system for a money handler in a vendor capable of a plurality of customer selectable transactions, having means for identifying the denominations of items of money deposited in the vendor, said system comprising:

change storage means for storing coins of different denominations for use as change;

means for issuing coins from the storage means in change in different amounts;

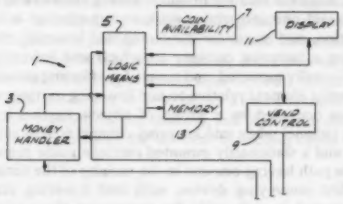
coin availability determining means for determining which denominations of coins are available as change;

a vend control for permitting a vend;

memory means for storing data representing a plurality of

coin combinations, each coin combination corresponding to the coins to be returned for a particular amount of change due and a particular availability of coins in the change storage means; and

logic means for determining the amount of credit accumulated as a result of the deposit of money in the vendor, for comparing the price of a selected transaction with the accumulated credit to determine the amount of change



due the customer, for obtaining from the memory means the coin combination, if any, corresponding to the amount of change due and the availability of coins in the change storage means, and for governing the vend control to permit a vend if the memory means contains data representing a valid coin combination for said amount of change due and the particular availability of coins in the change storage means.

4,462,513

TESTING COINS

Robert Dean, Slough, and Paul S. Raphael, Wokingham, both of England, assignors to Mars, Inc., McLean, Va.

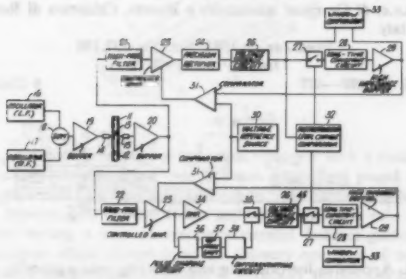
PCT No. PCT/GB81/00014, 371 Date Oct. 2, 1981, 102(e) Date Oct. 2, 1981, PCT Pub. No. WO81/02354, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 5, 1981, Ser. No. 308,548

Claims priority, application United Kingdom, Feb. 6, 1980, 8004028

Int. Cl.³ G07F *3/00*

U.S. Cl. 194—100 A **25 Claims**



1. Apparatus for testing coins, comprising a coin passageway, means (14 to 21, 24, 26) for producing an electrical signal of which a parameter varies on the passage of a coin into a test position along the coin passageway in dependence on a characteristic of the coin, means (33) for examining the variation of said parameter as a test for coin acceptability, and automatic control means (23, 30, 31) operative to regulate the operation of said signal producing means so as to hold the value of said parameter at a controlled value in the absence of the coin, and characterised by means (28,29) operative, while said parameter is varied from the controlled value due to presence of a coin, to store said controlled value of said parameter, and further by said parameter examining means being arranged to derive from said stored value of the parameter a reference value for comparison with the varied parameter value caused by presence of the coin to test for coin acceptability.

4,462,514

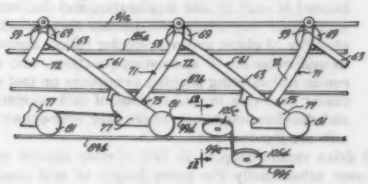
ACCELERATING AND DECELERATING WALKWAY HANDRAIL

Phillip E. Dunstan, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 16, 1981, Ser. No. 321,401

Int. Cl.³ B65G *17/00*

U.S. Cl. 198—334 **1 Claim**



1. An accelerating and decelerating walkway handrail comprising:

(A) a plurality of overlapping handrail elements; and

(B) movement and control means coupled to said plurality of overlapping handrail elements for moving said handrail elements about a vertical, generally oval path of travel that includes acceleration, constant-speed and deceleration zones and for controlling the amount of handrail element overlap in said acceleration, constant-speed, and deceleration zones such that the amount of overlap decreases in said acceleration, remains constant in said constant-speed, and increases in said deceleration zones, said movement and control means comprising:

(1) overlap control means for controlling the amount of overlap between adjacent overlapping handrail elements such that said amount of overlap decreases in acceleration, remains constant in constant-speed, and increases in deceleration zones, said overlap control means including:

(a) a plurality of discrete cam rails mounted inside of said vertical, generally oval path of travel, said plurality of cam rails converging toward, lying parallel to, and diverging from said vertical, generally oval path of travel in a predetermined discontinuous manner in said acceleration and deceleration zones;

(b) a plurality of rigid arms mounted inside of said vertical, generally oval path of travel and connected together to fold and unfold, said plurality of rigid arms being connected to said plurality of overlapping handrail elements such that the folding and unfolding action of said plurality of rigid arms causes a respective decrease and increase in the amount of overlap between adjacent handrail elements, said plurality of rigid arms including a plurality of leading arms and a plurality of trailing arms, said leading arms and trailingarms being joined together in an alternating manner and positioned such that one (outer) set of alternating junctions lies outwardly from the other (inner) set of alternating junctions, said outer set of alternating junctions being connected to the leading edge of said plurality of overlapping handrail elements, said plurality of leading and trailing arms moving through an over-center position as said arms are folded, said over-center position lying between a trailing position whereat said trailing arms point downstream of the direction of movement of said plurality of handrail elements and a leading position whereat said trailing

arms point upstream of the direction of movement of said handrail elements;

(c) a plurality of groups of rollers mounted on said plurality of rigid arms, said plurality of groups of rollers being positioned such that each of said groups selectively impinges a different one of said plurality of discrete cam rails, said selective impingement applying forces to said plurality of rigid arms that control said folding and unfolding action of said plurality of rigid arms; and

(d) an over-center mechanism for moving said trailing arms through said over-center position, said over-center mechanism including a plurality of over-center cam rails, one of said over-center cam rails being located in each of said acceleration and deceleration zones, said over-center mechanism also including a plurality of plates and over-center rollers connected to said other set of alternating junctions, said over-center rollers being adapted to impinge on said over-center cam rails in said regions of said acceleration and deceleration zones where said over-center cam rails are located; and

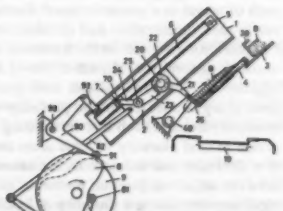
(2) drive means coupled to said overlap control means over substantially the entire length of said constant-speed zones for moving said plurality of rigid arms and, thus, said plurality of overlapping handrail elements about said vertical, generally oval path of travel, said drive means including a main drive cable, a plurality of path sheaves that direct said main drive cable along a path of travel that underlies said constant-speed zones and gripping means forming part of said overlap control means for gripping said main drive cable in said constant-speed zones, said gripping means comprising a first jaw element formed in the trailing edge of said leading arms and a second jaw element formed on the plates of said over-center mechanism.

4,462,515

APPARATUS FOR TRANSFERRING GROUPS OF DISC-SHAPED OBJECTS

Herbert Fischer, Emmenbrücke, Switzerland, assignor to SIG - Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Feb. 1, 1982, Ser. No. 344,830
Claims priority, application Switzerland, Feb. 6, 1981, 814/81
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—426 **3 Claims**



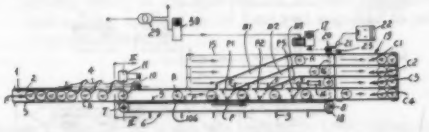
1. In apparatus for transferring a group composed of a selected number of objects from a first conveying device to a second conveying device for supply, in groups, to a packaging machine, the improvement comprising: means defining a lowering channel which is pivotal between a first position in which it can receive a group of objects from said first conveying device, and a second position in which it can transfer each such group to said second conveying device; means supporting said lowering channel at one end for pivotal movement relative to a stationary axis at a location such that, when said lowering channel is in its first position the end of said lowering channel opposite to its one end is at a higher elevation than said one end; means defining a lowering element mounted for movement along said lowering channel for guiding a group of objects from said first conveying device onto said lowering channel; and means connected to said lowering element for displacing said lowering element, during pivoting of said lowering channel from said first position into said second position, upwardly toward the location of said lowering channel end opposite to its said one end when said lowering channel is in said first position, said means for displacing said lowering element comprising a lowering carriage on which said lowering element is pivotally mounted, and means for effecting pivoting of said lowering element relative to said lowering carriage out of the region occupied by a group of objects carried by said lowering channel when said lowering channel is in its said first position, and a stationarily mounted carriage guide presenting first guide path having one end in the vicinity of the outlet end of said first conveying device, with said lowering carriage being mounted in said guide for movement along said first guide path, and wherein said means for effecting pivoting of said lowering element comprise: a control rail pivotally mounted via one end on said carriage guide in the region of said one end of said guide path and presenting a second guide path; a slide block mounted in said rail for movement along said second guide path; a setting arm pivotally mounted at one end to said lowering carriage and at its other end to said slide block; means for transferring pivotal movement of said setting arm to pivot said lowering element; and drive means composed of a first cam, a first lever arm connected between said first cam and the end of said control rail opposite said one end thereof, a second cam, and a second lever arm connected between said second cam and said lowering carriage, said drive means acting to drive said control rail and said lowering carriage in synchronism for moving said lowering element along said lowering channel and for effecting such pivoting of said lowering element in order to displace said lowering element over a selected path.

4,462,516

CONTAINER ORIENTING AND DIRECTING APPARATUS

Alessandro Guerzoni, Bologna, Italy, assignor to G.A.R.BO. s.n.c. di Guerzoni Alessandro e Renato, Calderara di Reno, Italy

Filed Jan. 5, 1982, Ser. No. 337,198
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—427 **5 Claims**



1. Apparatus for orienting and directing into a plurality of container conveying channels a single file of randomly shaped containers, comprising

(a) a first conveyor on which said single file of containers is caused to travel in a guided manner;

(b) means for controlling the flow of said containers on said first conveyor, and for suitably spacing them, comprising a screw means arranged partly over said first conveyor and continuously driven in rotation;

(c) a second conveyor provided with equi-spaced metallic fingers having one of their ends pivotably attached to said second conveyor and provided on their pivoted ends with an outwardly extending appendage, said fingers, when in working position, extending outwardly therefrom and transversely over said first conveyor, so as to longitudi-

nally sweep it, and within which fingers at least one container is received from said screw means and is retained in the required spaced position, the operation of said second conveyor being synchronized with the operation of said screw means, and said second conveyor being arranged laterally and longitudinally of said first conveyor, with at least its active branch in parallel relation thereto, and running in the same direction as said first conveyor; and

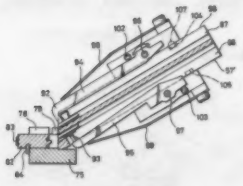
(d) deflecting blades for diverting said containers into sorting channels leading to container conveying channels, a given number of containers being led in-phase by said second conveyor into contact with said deflecting blades, said blades being, upon control, simultaneously shifted into their working position, each before a respective one of said containers so as to direct a said container into the corresponding sorting channel, and then being returned to their rest positions for the next deflecting cycle.

4,462,517

FASTENER-ATTACHING APPARATUS

Akihiko Takata, Fujisawa, and Yoshihiko Hasegawa, Kawasaki, both of Japan, assignors to Scovill Japan Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1982, Ser. No. 377,292
Claims priority, application Japan, Oct. 26, 1981, 56-170188
Int. Cl.³ B65G *47/68*
U.S. Cl. 198—451 **5 Claims**



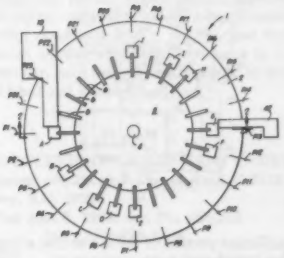
1. In a fastener-attaching apparatus equipped with a feeder for selectively delivering two different component pieces of fasteners from two separate feed hoppers to an attaching point, the improvement in said feeder which comprises a pair of tracks having a pair of vertically parallel fastener-guiding T-grooves which extend from the delivery openings of said two feed hoppers and terminate in vertically juxtaposed fastener discharge outlets, a shifting mechanism for selectively closing and opening said T-grooves of said tracks, a guide having a guide groove provided at right angles to said T-grooves and extending to said fastener-attaching point, with said fastener discharge outlets open in said guide groove, a fastener limiter slide located opposite to said discharge outlets and urged by a spring slidably and partly into said guide groove, said limiter slide having separate fastener-piece-receiving recesses corresponding, respectively, to the upper and lower discharge outlets, and a pusher bar slidable in said guide groove and which, when driven through said guide, causes said limiter slide to retract and pushes each fastener piece to said attaching point.

4,462,518

APPARATUS AND METHODS FOR HANDLING ELECTRICAL COMPONENTS

John Fajt, and James V. Neal, Jr., both of Wynnewood, Okla., assignors to Xenell Corporation, Wynnewood, Okla.

Division of Ser. No. 186,589, Sep. 12, 1980, Pat. No. 4,454,941.
This application Aug. 5, 1982, Ser. No. 405,585
Int. Cl.³ B65G *47/86*
U.S. Cl. 198—479 **7 Claims**



1. An apparatus for handling electrical components, comprising:

a vertically reciprocable rod having a central bore in a lower end thereof for receiving said electrical components one at a time, and having a plurality of vertical slots therethrough communicating with said central bore thereby dividing a lower portion of said rod into a plurality of downward extending fingers;

a vertically oriented friction tube within which said rod is reciprocably disposed;

vertical movement means for reciprocating said rod vertically within said friction tube;

lateral movement means for moving said rod laterally;

actuating means for moving said downward extending fingers between a radially expanded position wherein one of said electrical components may be received therebetween and a radially contracted position wherein said electrical component is clamped between said fingers, so that said electrical component is fixed relative to said fingers; and

wherein said friction tube includes friction means for frictionally engaging said rod so that a vertical position of said rod relative to said tube is maintained in the absence of any vertical force other than gravity acting on said rod, and so that said vertical movement means can move said rod vertically within said friction tube.

4,462,519

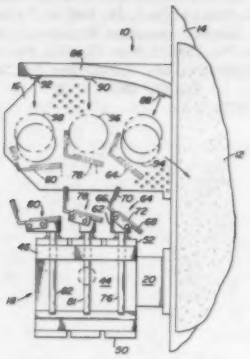
GLASS CONTAINER PUSHER

Edward Parkell, Millville, and Albert J. Tamagni, Vineland, both of N.J., assignors to Maul Technology Corporation, Millville, N.J.

Filed Aug. 3, 1982, Ser. No. 404,937
Int. Cl.³ B65G *25/00*
U.S. Cl. 198—490 **10 Claims**

1. A pusher for transferring plural containers onto a conveyor comprising a plurality of motors on a common support for movement therewith, means for oscillating said support through an arc, a discrete rod associated with each motor, a discrete finger attached to a free end of each rod, each motor being adapted to reciprocate its rod between extended and retracted positions with respect to said body, and means for

causing each rod to be sequentially and independently moved by its motor to its retracted position after each rod has traversed a sufficient portion of the arc so that a container pushed thereby has transferred onto a conveyor.



4,462,520

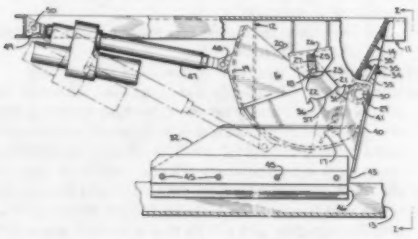
RETRACTABLE SKIRT GATE

Robert W. Strehlow, 12912 W. Prospect Dr., New Berlin, Wis. 53157

Filed Aug. 4, 1982, Ser. No. 405,291

Int. Cl.³ B65G 47/19

U.S. Cl. 198—525 8 Claims



1. Conveyer loading equipment comprising a hopper having a forward and rear wall and lateral sides, a retractible skirt assembly pivotally mounted on said hopper with lateral side members overlapping the lateral sides of said hopper, the lower edges of said skirt assembly side members forming a seal with the conveyer to prevent spillage of material, a gate pivotally mounted on said hopper arranged to open and close, in varying degrees, the discharge end of said hopper, said gate carrying a cam member and said skirt having a cam follower mounted thereon, the arrangement being such that when the gate is moved to closing position, the cam engages the follower to lift the skirt from the conveyer and when the gate is activated prior to efective gate opening, the skirt is moved into sealing relation with the conveyer and held in such position regardless of the extent to which the gate is opened.

4,462,521

TRANSFER MECHANISM

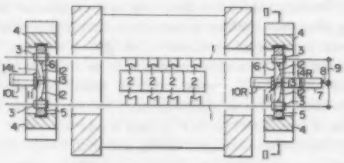
Tomio Takagi, Nilhama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,407

Int. Cl.³ B65G 25/00

U.S. Cl. 198—621 5 Claims

1. A transfer mechanism comprising a pair of substantially parallel feed bars, at least one pair of opposed jaws each jaw being mounted on a corresponding one of said bars, means for supporting said bars for movement in three directions, each direction of movement being substantially perpendicular to the other two directions of movement, an accumulator for accumulating hydraulic fluid at a predetermined pressure and three separate drive means operable to effect cyclic movement of said bars in said three directions, wherein each said drive



means comprises at least one double-acting hydraulic cylinder, one of the working chambers of said double-acting hydraulic cylinder communicating with said accumulator, at least one cam-operated hydraulic pump having a working chamber which directly communicates with the other working chamber of said double-acting hydraulic cylinder, and means for driving the cams of said pumps in timed relation to operate said pumps in a predetermined sequence.

4,462,522

VIBRATORY CONVEYOR

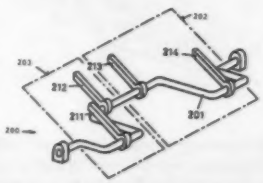
René Fluck, Schleitheim, Switzerland, assignor to SIG - Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 19, 1982, Ser. No. 360,172

Claims priority, application Switzerland, Apr. 3, 1981, 2294/81

Int. Cl.³ B65G 27/18

U.S. Cl. 198—766 8 Claims



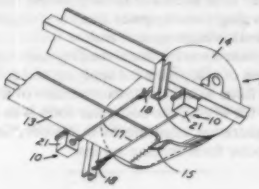
1. In a vibratory conveyor composed of a plurality of parallel side-by-side vibratory conveying troughs for transporting fragile articles, the improvement comprising conveyor drive means composed of a rotatable drive shaft and at least one group of at least four drive elements each connected to undergo oscillatory movement in response to rotation of said drive shaft, with each said trough being connected to only one respective drive element to undergo vibratory movement in response to rotation of said drive shaft, with said drive elements of said group being arranged in two equal subgroups bearing a mirror image configuration to one another relative to a plane normal to the axis of rotation of said drive shaft, and with said drive elements of each said subgroup being connected to said drive shaft in such a manner that their respective oscillatory movements are uniformly offset in phase from one another.

4,462,523

DAMAGED CONVEYOR BELT DETECTOR

James F. Kerr, Crosswell, Mich., assignor to Material Control, Inc., Crosswell, Mich.

Filed Sep. 29, 1982, Ser. No. 426,594
Int. Cl.³ B65G *43/00*
U.S. Cl. 198—810 15 Claims



1. A damaged conveyor belt detector, for use on a conveyor having and endless belt, comprising:

means for switching a circuit on and off attached to a first side of the conveyor proximate the endless belt, said switching means being moveable between a first and a second position for opening and closing said switching means;

means for moving said switching means between a first and a second position;

a socket attached to the first side of the conveyor and having an open end directed toward said endless belt;

a ball detachably received within said socket;

a cable extending across the conveyor below and adjacent to the endless belt from a second side of the conveyor to the ball in the socket on the first side of the conveyor;

switch actuating means slidably received in said socket and cooperating with said switching means to move said switching means from the first position to the second postion in response to detachment of said ball from said socket; and

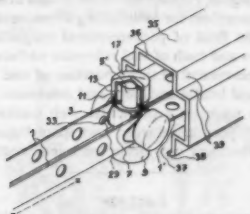
said cable being disposed for engagement with a damaged portion of the endless conveyor belt wherein said ball is detached from said socket when the damaged portion of the endless conveyor belt engages said cable to switch the circuit.

4,462,524

ENDLESS CHAIN CONVEYOR

Bernard Mallet, Limay, France, assignor to Nadella, Rueil Malmaison, France

Filed Oct. 27, 1981, Ser. No. 315,472
Claims priority, application France, Oct. 27, 1980, 80 22903
Int. Cl.³ B65G *39/20*
U.S. Cl. 198—845 4 Claims



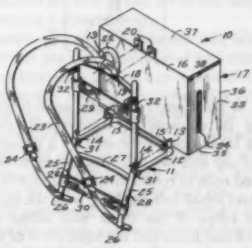
1. In an endless chain conveyor comprising an assembly of links, each link comprising a pair of longitudinally extending bars, spider members, each spider member comprising a first pair of opposed first trunnions, which trunnions are substantially horizontal and define an articulation with a corresponding pair of said bars, carrier rollers capping said first trunnions, a second opposed pair of second trunnions, which second trunnions are substantially vertical and define an articulation with an adjacent pair of said bars, steering rollers capping said second trunnions, and the carrier and steering rollers being capable of rolling along a track carried by said guide rail; the improvement wherein each roller comprises a combination of a rolling bearing and a cup of plastics material, the rolling bearing comprising cylindrical rolling elements and a press-formed sleeve provided with a radial flange for axially retaining the rolling elements, and the cup of plastics material being mounted on said sleeve, each roller having a bead connected to the cup, and being combined with a washer, and means for preventing rotation of the washer with respect to a corresponding adjacent bar, each roller being mounted by a clipping together of said bead and said washer.

4,462,525

PORTABLE TELEVISION EQUIPMENT CARRIER

Robert W. Pingleton, and Frank J. Downs, both of 2122 Walton Way, Newberry, S.C. 29108

Filed Apr. 8, 1983, Ser. No. 483,215
Int. Cl.³ A45F *3/04*
U.S. Cl. 224—210 1 Claim



1. A portable television equipment carrier, comprising, in combination, a case for containing home television equipment, and a tubular aluminum frame upon which said case is mounted, said frame including means for being carried upon a person's back, said frame comprising a main support member and a pair of legs pivotally attached to said main support member; said main support member comprising a configurated tube formed with parallel "L"-shaped portions at its opposite ends and a straight interconnecting portion between corresponding one ends of said "L"-shaped portions, for forming a framework upon which said case is placed, an arcuate cross-piece and an elastic back strap between corresponding opposite ends of said "L"-shaped portions, for resting against said person's back; each said leg being pivoted at one end from a right angle corner formed on each said "L"-shaped portion, a hip strap between said legs, a pair of adjustable shoulder straps attached from said arcuate cross-piece to a free opposite end of each said leg, and said case being affixed to said frame by means of flaps.

4,462,526

CONTINUOUS BRIQUET SHEET SEPARATOR

Kenneth R. Dumont, Charlotte, and Jack R. Robinson, Pineville, both of N.C., assignors to Midrex Corporation, Charlotte, N.C.

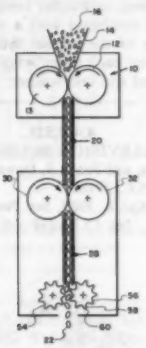
Filed Jun. 14, 1982, Ser. No. 388,374
Int. Cl.³ B26F *3/00;* B02C *13/22;* B26D *1/24;* B23D *19/06*
U.S. Cl. 225—4 2 Claims

1. Apparatus for separating individual metallized iron briquets from a sheet consisting of briquets in generally uniform rows and columns connected by longitudinal and transverse webs comprising:

(a) shear roll means for severing the longitudinal webs of said sheet comprising a pair of shear rolls journaled on

parallel axes transverse of the longitudinal webs, the first of said shear rolls having shear lands adapted to align with alternate rows of briquets and reduced diameter portions adapted to align with the remaining rows of briquets, the second of said shear rolls having like shear lands and reduced diameter portions in reverse order from said first roll to mate therewith, the roll spacing and configuration defining a gap in which the briquets of adjacent rows are displaced in opposite directions from said sheet; and

(b) lobed roll means for fracturing the transverse webs, comprising a pair of lobed rolls journaled on parallel axes



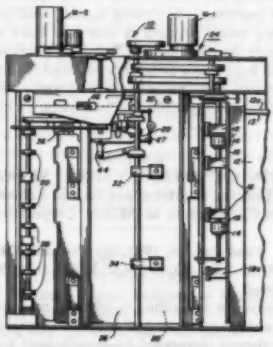
parallel to the transverse webs, each lobed roll having a plurality of equispaced, transversely extending lobes, adjacent lobes being separated by a distance between the length of one and two briquets, and means interconnecting said lobed rolls to rotate in synchronization with the lobes of one said lobed roll meshing with the midpoint between adjacent lobes of the other said lobed roll, the radial lengths of said lobes and the separation of the parallel axes being selected such that the exit path from said lobed roll means diverges from the entry path thereof by a small acute angle.

4,462,527

DEVICE FOR LATERAL REGISTRATION OF COMPUTER FORM DOCUMENTS FOR COPYING

Thomas N. Taylor, and Stephen J. Wenthe, Jr., both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 9, 1982, Ser. No. 416,183
Int. Cl.³ B65H *25/26*
U.S. Cl. 226—15 **15 Claims**



1. In a document handling apparatus for feeding an elongated continuous computer form web across and past the copying platen of a copier without bursting or damaging the web, the improvement in means for laterally registering the computer form web transversely of the feeding direction of the web over the platen without utilizing the sprocket holes of the computer form web comprising:

lateral platen registration edge means extending in the feeding direction of the computer form web over the platen; and

first computer form frictional feeding means for frictionally laterally urging the computer form web against said lateral registration edge means; and

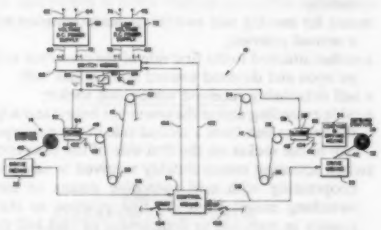
second computer form frictional feeding and skewing means downstream of said platen for applying a laterally skewing rotational force to a downstream portion of the computer form web for urging the computer form web against said lateral registration edge means in cooperation with said first computer form feeding means.

4,462,528

ELECTROSTATIC WEB CLAMP

Semyon Kisler, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 18, 1982, Ser. No. 389,862
Int. Cl.³ B65H *17/26, 17/28*
U.S. Cl. 226—120 **25 Claims**



13. Apparatus for maintaining a particular tension-force level on a selected length of a driven web of insulative material whenever web drive speed is reduced below a predetermined magnitude comprising:

a plurality of stationary, spaced-apart, electrically conductive reference members;

a multiplicity of electrically conductive generally parallel extending bristles having free ends thereof physically spaced from a surface of each of said reference members;

energizeable drive means coupled to said web in a driving relationship;

means for deriving a signal representative of the reduction of the web drive speed below predetermined value that is provided by said drive means; and

a first DC voltage source, responsive to said web drive force reduction signal, connected between said bristles and said reference members for establishing a noncorona generated electrostatic field of predetermined magnitude between said bristles and each of said reference surfaces to thereby preclude movement of those portions of said web located between said bristle ends and said reference surfaces and to thereby maintain a particular web tension level on a web-length portion between said spaced-apart reference member whenever web drive force is so reduced.

4,462,529

LINEAR ACCELERATOR SYSTEM FOR AXIALLY ADVANCING AN ELONGATE WORKPIECE

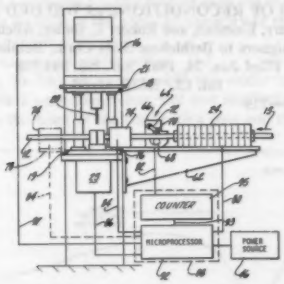
Harold A. Ladouceur, Livonia, Mich., assignor to Alpha Industries, Inc., Novi, Mich.

Filed Nov. 23, 1981, Ser. No. 323,785
Int. Cl.³ B65H *17/26*; B65G *15/44*
U.S. Cl. 226—125 **10 Claims**

2. For use with a cutoff machine having a cutoff station for

cutting off a preselected length of electrically conductive tubing or the like, apparatus for feeding said tubing linearly along the longitudinal axis thereof toward said cutoff apparatus comprising:

an electrically responsive accelerator for moving said tubing linearly along said longitudinal axis toward said cutoff station, said accelerator including electrical coil means adapted to be coupled with a source of electrical power for producing an electromagnetic field circumscribing said longitudinal axis, said magnetic field being responsive to impose an axially directed force on said tubing urging said tubing toward said cutoff station, said accelerator including a bore therethrough coaxial with said longitudinal axis and through which said tubing may pass, said accelerator further including:



(1) a support,

(2) a kit including a plurality of sleeve means for slidably supporting said tubing in aligned coaxial relationship to said bore and each having an inside diameter corresponding to a respectively associated tubing size, and

(3) means for removably mounted each of said sleeve means on said support;

means for limiting the longitudinal movement of said tubing to a distance corresponding to said preselected length, and means for sensing when said tubing has moved said distance by said accelerator; and,

means responsive to said sensing means for controlling the operation of said accelerator.

4,462,530

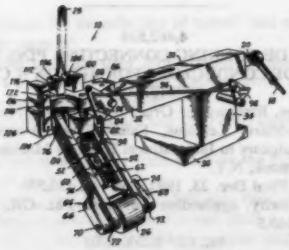
HIGH SPEED INDEXING SYSTEM

Charles Block, North Bellmore, and Leon Mintz, Syosset, both of N.Y., assignors to Joseph Galkin Corporation, Hicksville, N.Y.

Continuation of Ser. No. 110,100, Jan. 7, 1980, abandoned, which is a continuation of Ser. No. 772,061, Feb. 25, 1977, Pat. No. 4,182,251. This application Aug. 17, 1981, Ser. No. 293,762

Int. Cl.³ B65H *17/22*

U.S. Cl. 226—156 **1 Claim**



1. A system for enabling relatively high-speed indexing of apparatus used to perform sewing operations on a fabric, comprising, in combination:

a shaft member,

driving means,

transmission means responsive to said driving means for transmitting one-way rotational intermittent indexed motion at high speed to said shaft member,

roller assembly means spaced from said shaft member cooperatively responsive to said shaft member for pulling the fabric along a path from a stitching machine, said assembly means possessing an inertia of magnitude capable of being calculated,

a base associated with said system,

a support plate extending from said base adapted to support said shaft member, said support plate having a free end portion,

a pin connected to said free end portion of said support plate disposed in perpendicular relationship with respect to the axis of said shaft member,

a lever arm unit rotatably connected to said pin, said lever arm unit having a first portion on one side of said pin and a second portion on the other side of said pin, said first portion forming a first cup,

a block member connected to said support plate and spaced from said second portion of said lever arm unit, said block member forming a counterbore,

a movable member positioned between said block member and said second portion of said lever arm unit, said movable member forming a second cup opposed to and spaced from said first cup and further forming a threaded hole aligned with said second cup and with said counterbore,

a helical compression spring positioned between said movable member and said second portion in said first and second cups, said spring being aligned approximately perpendicular to the alignment of said pin,

a threaded bolt positioned in said counterbore of said block member and threadably mounted in said threaded hole of said movable member, and

a bearing member spaced from said first portion of said lever arm unit and connected to said support plate, said bearing member having a shaftway, said shaft member being positioned in said shaftway, said shaft member having a free shaft end proximate to said first portion of said lever arm unit,

a first braking disk disposed between said first portion of said lever arm unit and said free shaft end, and a second braking disk disposed around said shaft proximate to said bearing member,

said roller assembly means being connected to said shaft member between said first and second disks,

whereby when said bolt is screwed in to compress said spring, said lever arm unit compresses said first and second braking disks with said shaft member to selectively inhibit the rotation of said shaft member and for controlling normally undesirable interia-influenced motion of said roller assembly means.

4,462,531

PAPER FEED TRACTOR WITH BELT TENSIONING

Alan F. Seitz, New Hartford, Conn., assignor to Data Motion, Incorporated, Torrington, Conn.

Filed Sep. 10, 1982, Ser. No. 416,682

Int. Cl.³ B65H *17/34*; G03B *1/30*

U.S. Cl. 226—171 **15 Claims**

1. In a drive tractor for web material adapted to be mounted on a printer or the like, the combination comprising:

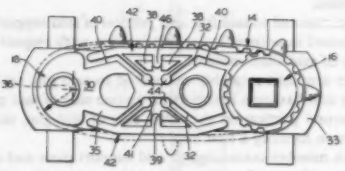
A. a chassis having a pair of spaced transversely extending apertures therein for receiving a pair of shafts of an associated printer or the like to mount it thereon, at least one of said apertures being adjacent an end thereof;

B. a flexible endless one-piece belt extending about said chassis in a plane generally perpendicular to the axes of

said apertures, said belt defining a closed path of travel thereabout and having an outer driving surface adapted to engage the associated web material and an inner driven surface;

C. A pulley rotatably mounted in said one chassis aperture and in engagement with said driven surface of said belt, said pulley having an aperture therethrough for receiving a drive shaft to effect rotation of said pulley and thereby said belt, the other of said apertures being adapted to receive a support shaft;

D. convexly arcuate belt support means adjacent the end of said chassis spaced from said drive pulley, said belt extending about said support means and pulley and extending in a web drive path therebetween;



E. a guide means mounted on said chassis for reciprocal movement between a closed position overlying said web drive path and an open position; and

F. belt tensioning means movably supported on said chassis between said pulley and said belt support means and below said belt drive path for resilient deflection in a direction normal thereto, said belt tensioning means biasing said belt against said guide means and including a support plate elongated in the direction of said web drive path and having portion of its upper surface extending parallel to the plane of said web drive path, said belt tensioning means also including resiliently deflectable means acting on said support plate.

4,462,532

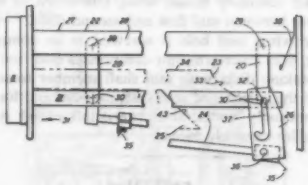
DISPLACEMENT SOLDERING DEVICE

Wesley O. Davis, Jr., Plaistow, N.H., and Ernest Gallo, Boxford, Mass., assignors to EPE Corporation, Manchester, N.H.

Filed Nov. 12, 1982, Ser. No. 441,090

Int. Cl.³ B23K *1/08*

U.S. Cl. 228—40 **9 Claims**



1. A displacement soldering device comprising a container for molten solder, a support structure, having first and second ends, arranged to support an object to be soldered, between said first and second ends, over the surface of solder in the container, means for displacing the solder surface vertically relative to the container and the support structure into contact with said object to be soldered, when supported thereby, to effect a soldering operation thereon and a support structure handling mechanism having:

a first member to which said first end is pivotally attached;

a latch, to which said second end is pivotally attached, moveable between latched and unlatched operational positions, said latch in its latched position being pivotally supported on said first member and in its unlatched position permitting said support structure to pivot downwardly about said first end;

means for lateral displacement of said support structure between a soldering position and an object access position;

means for unlatching said latch when said solder is displaced into contact with said object supported by said support structure;

means for latching said latch subsequent to a soldering operation; and

means for elevating said support structure during said lateral displacement from said soldering position and for lowering said support structure during said lateral displacement to said soldering position.

4,462,533

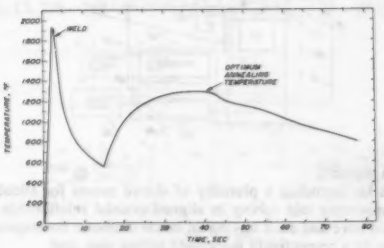
METHOD OF RECONDITIONING WELDED JOINTS

Samuel T. Furr, Emmaus, and Robert E. Bauer, Allentown, both of Pa., assignors to Bethlehem Steel Corp., Bethlehem, Pa.

Filed Jun. 24, 1982, Ser. No. 391,738

Int. Cl.³ B23K *31/00*

U.S. Cl. 228—119 **5 Claims**



1. A method of welding and annealing an aluminum-zinc alloy coated ferrous wire, where the coating thereof consists of an aluminum-zinc alloy overlay and an intermetallic alloy layer, said intermetallic layer being between said alloy overlay and the ferrous wire, and reconditioning the welded area to restore the corrosion resistant properties to said area, comprising the steps of bringing together two sections of said coated wire into solid contact to form a continuous wire, welding said sections to form a welded area, annealing said welded area by heating the continuous strand to a temperature between 1200° to 1450° F., brushing said welded area to remove said alloy overlay and to prevent the formation of oxides on said intermetallic alloy layer while the continuous wire is at a temperature above about 1200° F., cooling said continuous wire, reheating said continuous wire to a weld repair temperature between about 800° and 1000° F., applying to said welded area a repair stick of a zinc containing alloy free of lead and flux, and cooling said continuous wire to room temperature whereby a coating of said zinc alloy is caused to solidify about said welded area.

4,462,534

METHOD OF BONDING CONNECTING PINS TO THE EYELETS OF CONDUCTORS FORMED ON A CERAMIC SUBSTRATE

Alex Bitaillou, Bretigny sur Orge; Jean Masson, Noisy/Ecole, and Jean-Marie Lemoine, Saint-Michel-sur-orge, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,530

Claims priority, application European Pat. Off., Dec. 29, 1981, 81430045.5

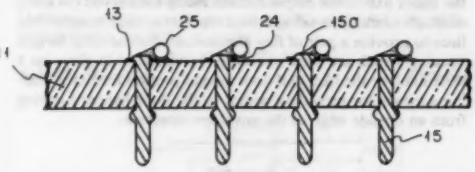
Int. Cl.³ B23K *3/02*

U.S. Cl. 228—180 A **10 Claims**

1. A method of bonding the heads of connecting pins inserted in apertures in an insulating substrate to the correspond-

ing eyelets which are disposed on the top surface of the substrate in accordance with a specific pattern, comprising the steps of:

applying a droplet of flux to the head of each connecting pin adjacent to the corresponding eyelet,



applying a solder ball to the head of each pin to which it will adhere because of the adhesive capacity of the flux previously deposited thereon,

heating to cause a solder reflow, and

allowing to cool so as to enable the solder to set and to provide a permanent electrical and mechanical bond between the head of the connecting pins and the eyelets.

4,462,535

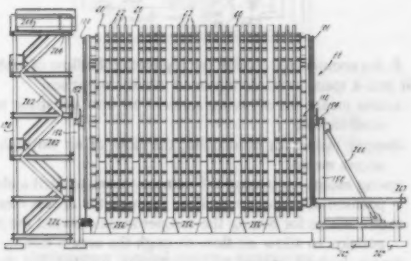
APPARATUS AND PROCESS FOR MANUFACTURE OF TUNNEL TUBES

Edward Johnston, Newark, Del.; Morton Jacobs, Houston, Tex.; Melvin E. Miller, Havre de Grace, Md., and Robert A. Kaucic, Newark, Del., assignors to AMCA International Corporation, Hanover, N.H.

Division of Ser. No. 256,710, Apr. 23, 1981, Pat. No. 4,418,561. This application Aug. 26, 1983, Ser. No. 518,668

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—184 **5 Claims**



1. A process for manufacture of tunnel tube modules comprising the steps of:

(a) rolling up a flat steel plate around a collapsible fixture into a cylindrical shell, said fixture having a plurality of wheel mechanisms thereon,

(b) positioning said fixture and shell onto supports for rotation,

(c) assembling a support framework on the external surface of said shell,

(d) lowering said fixture and shell onto base means,

(e) collapsing said fixture within said shell,

(f) raising up said collapsed fixture within said shell,

(g) lowering the wheel mechanisms into operating positions, and

(h) removing the fixture from said shell.

4,462,536

CONTAINER MADE FROM A LAMINATE OF FIBER LAYERS

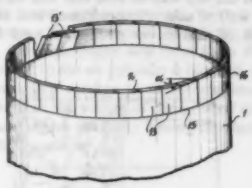
Norbert E. A. Junge, Troisdorf, and Gerrit Kraan, Hennef, both of Fed. Rep. of Germany, assignors to Van Leer Verpackungen GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 19, 1983, Ser. No. 459,193

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3202033

Int. Cl.³ B65D *3/18*

U.S. Cl. 229—5.5 **4 Claims**



1. In a container having an axis, at least one wall member, and a flat bottom member, said at least one wall member and said flat bottom member each comprising a plurality of fiber layers, and in particular a plurality of layers of kraft paper, said at least one wall member comprising a bottom portion bounded by a folding line, and lips formed in said bottom portion and adapted to be folded at said folding line and adhered to said flat bottom member to form a connection between said wall member and said bottom member, the improvement wherein

a hot meltable adhesive is used for adhering the individual layers of said plurality of fiber layers together to form said at least one wall member, said lips and said flat bottom member, said hot meltable adhesive being applied to said lips in a hot condition prior to their complete folding against said flat bottom member,

said lips being formed by linear incisions in said bottom portion extending parallel to said axis of said container up to said folding line, the planes of said incisions being at an acute angle with respect to a tangential plane of said at least one wall member, said tangential plane being parallel to said axis,

whereby said hot meltable adhesive enables said individual layers of said lips to slide relative to each other when said lips are folded from said wall member against said bottom member, and wherein a portion of said lips overlap a portion of an adjacent lip once said lips are folded against and adhered to said bottom member.

4,462,537

EGG CONTAINER

Hendrikus Grootherder, No. 31 Arnhemsestraat, 6971 AP Brummen, and Hendrik J. Grootherder, No. 13 Knoevenoordstraat, 6971 LG Brummen, both of Netherlands

Filed Oct. 7, 1981, Ser. No. 309,471

Claims priority, application Netherlands, Oct. 21, 1980, 8005790

Int. Cl.³ B65D *45/00*

U.S. Cl. 229—45 EC **6 Claims**

1. A box for transporting and selling eggs in fixed amounts comprising:

a bottom portion including upwardly projecting standing sidewalls being substantially flat and being tapered from a bottom wall to project upwardly and outwardly, said bottom wall including cutout sections;

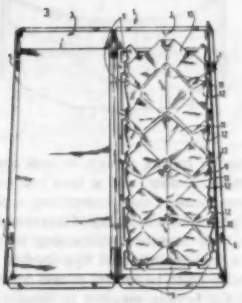
a cover portion including, in a closed position relative to said bottom portion, downwardly projecting standing sidewalls being substantially flat and being tapered from a top wall to project downwardly and outwardly to engage

with said upwardly projecting standing sidewalls of said bottom portion in said closed position;

engagement means for releasably retaining said top portion relative to said bottom portion in said closed position; and

a separate egg supporting insert being disposed within said bottom portion for accommodating a plurality of eggs in a spaced apart arrangement;

said cover in an open position being substantially coplanar with respect to said bottom portion for permitting nesting of a plurality of empty boxes wherein a cover portion of a first box will nest with a cover portion of a juxtapositioned box with the top wall of said first box being spaced from the top wall of said juxtapositioned box and said tapered sidewalls of said cover portion of said first box being



partially in contact with said tapered sidewalls of said cover portion of said juxtapositioned box and said insert in said first box projecting through said cutout sections of said juxtapositioned box and being in contact with said insert of said juxtapositioned box and said bottom wall of said first box being spaced from the bottom wall of said juxtapositioned box and said tapered sidewalls of said bottom portion of said first box being in partial contact with said tapered sidewalls of said bottom portion of said juxtapositioned box;

said cover portion and said bottom portion being constructed of a material receptive to printing wherein indicia may be directly imprinted on an exterior surface of said top wall and tapered sidewalls of both said cover portion and said bottom portion.

4,462,538

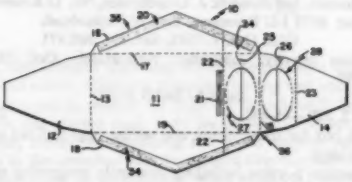
DOOR HANGER ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed May 18, 1983, Ser. No. 495,620

Int. Cl.³ B65D *27/00*

U.S. Cl. 229—68 R **6 Claims**



1. A two way envelope for initial hand delivery and subsequent return as first class matter through the U.S. Postal Service comprising, an envelope structure divisible into two portions along a perforated line, said first portion including means formed therein for hanging the envelope from a door knob or the like upon initial delivery and said second portion including an integral closure flap and sealed ends, said means for hanging the envelope on a door knob or the like further comprising an opening in the door hanger portion formed in the general shape of an ellipse by partial curved cut lines located at the ends of the major axis of the ellipse and a straight cut line which bisects the minor axis of the ellipse and intersects the curved cut lines, said curved cut lines being joined together at their ends by fold lines to provide a pair of flap elements within the door hanger opening which are used to secure the envelope in place on a door knob or the like, said door hanger portion further including a means for providing access to the door hanger opening from an outside edge of the envelope structure.

4,462,539

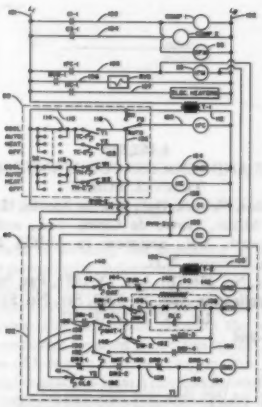
AIR CONDITIONING ECONOMIZER CONTROL METHOD AND APPARATUS

John D. Gilson, Bridgeport, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 323,799, Nov. 23, 1981, Pat. No. 4,404,815. This application May 9, 1983, Ser. No. 492,910

Int. Cl.³ G05D *23/00*; F24F *7/00*

U.S. Cl. 236—13 **4 Claims**



3. An economizer control for regulating the flow of ambient air into a space to be conditioned which comprises:

access means for allowing ambient air into the space to be conditioned;

damper means for controlling the flow of air through the access means;

spring means for biasing the damper means toward a closed position allowing no air flow through the access means;

motor means for biasing the damper means toward the open position to allow air flow through the access means;

motor locking means for electrically locking the motor means in position to maintain the damper means in position notwithstanding the spring means;

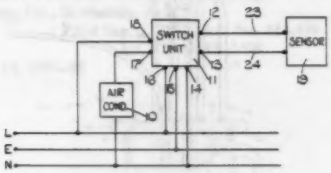
a two stage mixed air thermostat for sensing the temperature of the air flowing through the access means and return air from the space to be conditioned, the lower temperature stage being connected to de-energize the motor locking means when the temperature detected is below a first level and the higher temperature stage being connected to de-energize the motor means when the temperature detected is below a second level; and

a first switch connected to de-energize the motor means upon a predetermined displacement of the damper and a second switch connected to de-energize the motor locking means upon a predetermined displacement of the damper to maintain the damper in a vent position.

4,462,540
CONTROL SYSTEM FOR AN AIR TEMPERATURE CHANGING UNIT

Anthony Dytch, Wolverhampton, England, assignor to Allen-Martin Electronics Limited, Wolverhampton, England

Filed Sep. 14, 1982, Ser. No. 418,098
Claims priority, application United Kingdom, Sep. 19, 1981, 8128380; Oct. 16, 1981, 8131244
Int. Cl.³ G05D 23/00
U.S. Cl. 236—47 6 Claims

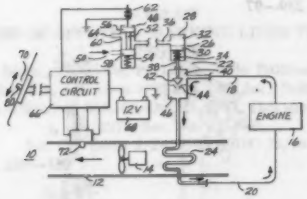


1. A control system for an air temperature changing unit comprising sound detecting means, temperature sensing means, means for activating an air temperature changing unit, said activating means comprising signalling means responsive to the sound detecting means and the temperature sensing means for generating a control signal and relay contacts responsive to the control signal for activating the air temperature changing unit, and means for blocking the sound detecting means for a short period each time said control signal changes state.

4,462,541
CONSTANT TEMPERATURE CONTROL FOR A VEHICLE COMPARTMENT HEATER OR HEATER-AIR-CONDITIONER

Gary P. Hansen, Federal Way, Wash., assignor to Red Dot Corporation, Seattle, Wash.

Filed Sep. 24, 1982, Ser. No. 422,710
Int. Cl.³ G05D 23/00
U.S. Cl. 237—2 A 7 Claims



1. A temperature control system, comprising:

duct means for delivering conditioning air to a region to be temperature conditioned by said air;

conduit means for delivering a hot liquid in a heat exchanging relation with the conditioning air in said duct means; and

means for maintaining the temperature of the conditioning air at a selected value, comprising:

a normally open off-on valve in said conduit means, said off-on valve including a valve orifice, a valve plug moveable into the valve orifice for closing the valve, and out from the valve orifice for opening the valve, with spring means normally biasing the valve plug into an open position, and air cylinder means operable in opposition to the spring, for moving the valve plug into a closed position;

a temperature level selector means for the region to be temperature conditioned;

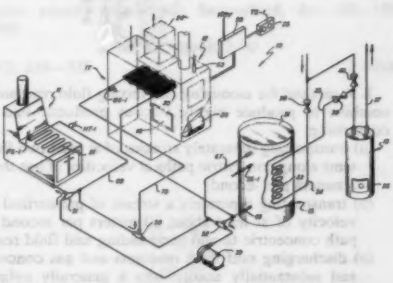
temperature sensing means for sensing the temperature of the conditioning air; and

control means responsive to a difference between the selected temperature level and the sensed temperature for moving the off-on valve into a fully closed position when the temperature of the conditioning air is higher than the selected temperature level, and moving the off-on valve into a fully open position when the selected temperature level is higher than the temperature of the conditioning air, said control means comprising a source of air under pressure, conduit means leading from such source to the air cylinder means, and a three-way valve in said conduit means, having a first position in which the air cylinder is vented to the atmosphere and flow from the source of compressed air to the air cylinder is blocked, and a second position in which passage to the atmosphere is blocked and flow is from the source of compressed air into the air cylinder, and means normally biasing the three-way valve into said first position.

4,462,542
HEATING SYSTEM

Thomas C. Person, 104 Robert Dr., Syracuse, N.Y. 13210

Continuation of Ser. No. 76,595, Sep. 18, 1979. This application May 11, 1981, Ser. No. 262,525
Int. Cl.³ F24D 3/08
U.S. Cl. 237—19 3 Claims



1. Apparatus for efficiently utilizing heat energy from an auxiliary source that includes

a flow line for circulating a heat transfer fluid through a loop,

a pump connected into said flow line for moving said fluid through the loop in a given direction,

first, second and third automatic three way diverting control valves connected in series in said flow line in the direction of flow and each of said valves being arranged to pass fluid circulating in said loop directly between an inlet connection and an outlet connection when said valve is energized whereby fluid passing through the valve is not diverted from said flow line,

said first and second valves in the series being arranged to pass fluid between said inlet connection and a bypass connection when said first and second valves are deenergized whereby fluid moving in the line is diverted from the flow line,

said third valve in the series being arranged to pass fluid between a bypass connection and said outlet connection when the valve is deenergized whereby fluid previously diverted from the line is returned to the loop,

an auxiliary heating unit connected in series flow relation between the bypass connection of the first valve and the inlet of the second valve,

a primary heating unit connected in series flow relation between the bypass connections of the second and third valves,

a fluid storage unit connected in series flow relation between

the outlet connection of the second valve and the bypass connection of the third valve, and

control means for independently energizing each of said valves so that a selected one of said units is placed in fluid flow communication with either one of the remaining two units whereby fluid can be exchanged between any two of the three units.

4,462,543

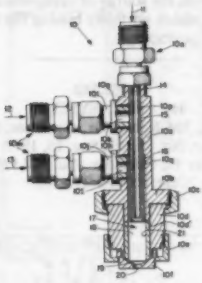
NOZZLE

Beany S. Yam, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 24, 1981, Ser. No. 334,275

Int. Cl.³ B05B 7/00

U.S. Cl. 239—8 **9 Claims**



1. A method for atomizing and mixing fluid reactants which combine to produce highly viscous products, said method comprising:

(a) transporting separately streams of at least two fluid reactants along concentric paths at velocities of less than about 3 meters per second;

(b) transporting separately a stream of pressurized gas at a velocity of at least about 20 meters per second along a path concentric to and surrounding said fluid reactants;

(c) discharging said fluid reactants and gas concentrically and substantially axially into a generally cylindrically shaped mixing chamber;

(d) causing said fluid reactants and said pressurized gas to flow along substantially concentric paths in a substantially axial direction within said mixing chamber, the relative velocity differential between said pressurized gas and said fluid reactants being sufficient to thereby atomize and entrain said fluid reactants in the pressurized gas stream to form an atomized fluid while minimizing the amount of turbulence induced to thereby control the mixing of said fluid reactants in the upper section of said mixing chamber; and

(e) inducing sudden turbulence in said atomized fluid at a point in said mixing chamber in the immediate vicinity of an axially aligned discharge orifice to substantially homogeneously mix the reactants within said atomized fluid, causing them to react at that point and in said orifice and to issue from said discharge orifice as a spray of product.

4,462,544

BEVERAGE SIPPER

Alois E. Rutzel, R.R. #2, Moores Hill, Ind. 47032, and Stefan Rützel, Thurëngerstr. 10, 8784 Burgsinn (Ufr) Bavaria, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,274

Int. Cl.³ A47G 19/22

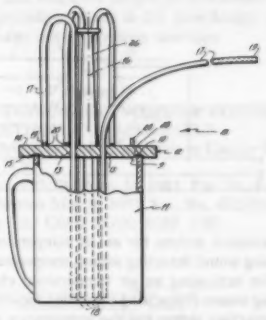
U.S. Cl. 239—33 **1 Claim**

1. A drinking device for a plurality of drinkers, comprising:

a beverage container, said container having a generally circular opening therein defined by a lip;

a base having a top surface, a bottom surface and a vertical axis, said base having an annular recess in said bottom surface which receives said lip to loosely seat said base thereon, said base having plural bores defined therein in spaced relation around and radially spaced from said vertical axis passing through top surface and said bottom surface;

plural elongate one-piece flexible drinking tubes extending through said bores, each of said tubes having a first and a



second end, said first end extending into said container and said second end utilized by the drinker for drinking, the tubes being removable from the base;

an elongated and substantially smooth handle fixed to said base extending substantially along said vertical axis, and

tube-retaining posts on said top surface in spaced relation around and radially spaced from said vertical axis for retaining said second end of said drinking tube when said tube is not being used.

4,462,545

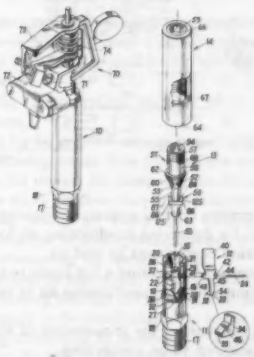
SPRINKLER DEVICE

Antonio Lourenco, 16 Lounsbury Ave., Waterbury, Conn. 06706

Filed Aug. 10, 1982, Ser. No. 406,996

Int. Cl.³ B05B 3/00

U.S. Cl. 239—97 **15 Claims**



5. Apparatus for regulating a fluid flow, comprising:

a housing having an internal cavity and a first and a second fluid port extending into said cavity;

cam means having contoured surface portions and rotatably mounted within said cavity;

means pivotally mounted within said cavity integrally formed to have a cam follower portion and a passageway restricting portion, said passageway restricting portion

being contoured for being hydraulically actuatable for pivoting the cam follower portion into engagement with said cam means, said cam follower portion being responsive to the surface contours of said cam means for pivoting the passageway restricting portion whereby said first fluid port is restricted.

4,462,546

ROTARY INDEXING NOZZLE FOR SWIMMING POOLS AND THE LIKE

Donald G. Pitman, Glendale, Ariz., assignor to Caretaker Systems, Inc., Scottsdale, Ariz.

Filed Sep. 2, 1982, Ser. No. 414,459

Int. Cl.³ B05B *3/08*

U.S. Cl. 239—97 **4 Claims**

1. A rotary indexing nozzle head comprising, a housing adapted to be received in a water supply source, a jet nozzle member having a discharge end mounted for rotation in said housing, holding members uniformly spaced around the periphery of said housing adjacent the discharge end of said nozzle member, and indexing means attached to the discharge end of said nozzle member, indexing means located in the path of water exiting from said nozzle member and impinged upon by such water for initially rotating said nozzle member and for moving into engagement with said holding members to terminate rotation of said nozzle member under the initiation and continuation of water flow through said nozzle.

4,462,547

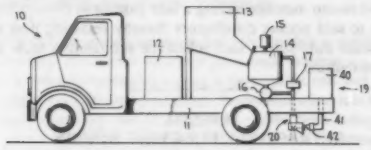
METHOD OF APPLYING MARKING LINES TO A ROAD SURFACE

Mac L. Metz, Allensville, Pa., assignor to Baltimore Paint & Chemical Co., a division of Dutch Boy, Inc., Baltimore, Md.

Division of Ser. No. 844,305, Oct. 21, 1977. This application Jul. 24, 1978, Ser. No. 927,468

Int. Cl.³ B05B *1/24, 9/03;* E01C *23/16*

U.S. Cl. 239—130 **11 Claims**



1. A machine system for forming a marking line of thermoplastic on the surface of a roadway comprising a melter unit for melting a thermoplastic to form a thermoplastic melt including a melting tank having first, second, and third sections, each of said sections having fluid flow tubes horizontally spaced therein, the uppermost of said sections having said tubes spaced a greater distance apart than said second section, and the second section having the tubes spaced a greater distance apart than said third section; and jacket means surrounding said melter tank, said jacket means and the outer wall of said melting tank forming a fluid flow space, said fluid flow space being in fluid communication with said horizontal tubes; a melt holding unit positioned in relation to said melting tank to permit gravitational flow from said melting tank into said melt holding unit; means for separably connecting said melter unit to said melt holding tank including gate means between said melting tank and holding tank for releasing under gravitational flow thermoplastic melt from said melting tank into said holding tank, a melt spray unit and transfer means for transferring said melt from said holding tank to said spray unit for spraying said melt onto the surface of a roadway to form a marking line.

4,462,548

INJECTOR, IN PARTICULAR FOR INJECTING CONCRETE

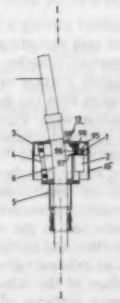
Ernst Egli, Fahrweid, Switzerland, assignor to Aliva Aktiengesellschaft, Widen-Mutschellen, Switzerland

Filed Jun. 9, 1982, Ser. No. 386,480

Claims priority, application Switzerland, Jun. 10, 1981, 3786/81

Int. Cl.³ B05B *3/00*

U.S. Cl. 239—225 **3 Claims**



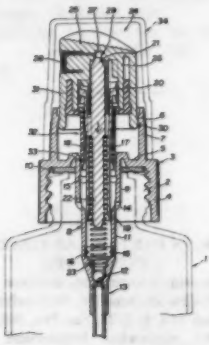
1. Injecting means, particularly for injecting concrete, including a feeding hose, a relatively fixed first means holding a portion of said hose, a second means movable relative to said first means in operative engagement with said hose downstream of said portion, and additional means for moving said second means in a circular path relative to said first means to move the downstream end of said hose without rotating said downstream end around its axis; said additional means including a first section comprising a motor and an eccentric device driven by said motor, said motor and said eccentric device being interposed between said first and second means and said additional means also includes a second section comprising holding means interposed between said first and second means to cooperate with said eccentric device to constrain movement of said second means to a circular path upon operation of said motor, said holding means includes a cross joint shaft extending between said first and second means; said hose being engaged with said second means at a point located between first and second locations of said second means where the latter is connected with the respective first and second sections of the additional means.

4,462,549

MANUAL TYPE MINIATURE ATOMIZER

Tadao Saito; Takao Kishi, and Yoshiyuki Kakuta, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed May 26, 1982, Ser. No. 382,097
Claims priority, application Japan, Jun. 29, 1981, 56-97523[U]
The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.
Int. Cl.³ B05B 9/00
U.S. Cl. 239—333 4 Claims



1. A manual type miniature atomizer comprising:

a container having a neck portion,

mounting means detachably engaged with the neck portion of said container,

a main cylindrical member having a cylindrical guide portion depending from said mounting means into said container, a small-diameter cylinder depending from the lower end of the guide portion into said container and having smaller diameter than the guide portion and sucking means with a suction valve depending from the lower end of the cylinder into said container,

a hollow tubular member having first cylindrical piston attached to the outer lower periphery of a tubular portion and engaged within the small-diameter cylinder of said main cylindrical member elevationally movably, second cylindrical piston attached to the outer upper peripheral end of the tubular portion and having larger diameter than the first piston, and an exhaust valve upwardly protruded from the inner surface of the tubular portion in such a manner that the inner surfaces of both the pistons are communicated with one another,

a spring mounted within the small-diameter cylinder of said main cylindrical member for urging upwardly said tubular member,

an atomizing head having a large-diameter cylinder elevationally movably engaged with the second piston of said hollow tubular member and depending from the lower surface of a head portion, and exhaust valve hole closed by the pressure contact of the upper end of the exhaust valve body of said tubular member and perforated at the center on the lower surface of the head portion, and a nozzle hole communicated with the valve hole and perforated at the outer surface of the head portion, and

an outer cylindrical member having an upper end airtightly engaged with the outer surface of the large-diameter cylinder, third cylindrical piston attached to the outer lower peripheral end thereof and elevationally movably engaged with the guide portion of said main cylindrical member, and a liquid flow passage formed between said tubular member and said outer cylindrical member for communicating the large-diameter cylinder of said atomizing head with the guide portion of said main cylindrical member,

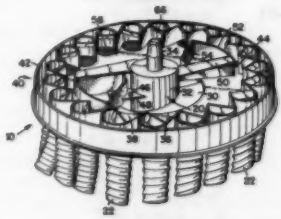
said guide portion having a hole at the lower end thereof and intimate contact releasing means formed on the inner surface of the guide portion disposed at the intermediary of the stroke of the third cylindrical piston of said outer cylindrical member.

4,462,550

APPARATUS FOR DISTRIBUTING A SUBSTANCE

Loren E. Tyler, Benson, Minn., assignor to Lor-Al Corporation, Benson, Minn.

Filed May 6, 1982, Ser. No. 375,384
Int. Cl.³ A01C 15/04
U.S. Cl. 239—655 4 Claims



1. On an implement for spreading a substance on the ground, said implement including a container with delivery tubes having outputs supported along a boom, apparatus for distributing said substance from said container among said delivery tubes, said apparatus comprising:

an auger within a tube, said auger having a pair of flights attached to a central core, said auger for receiving substance from said container in order to elevate said substance to an upper end;

means for rotating said auger;

a cylindrical housing having a bottom plate with a plurality of spaced apart outer openings approximately equidistant from the outer edge thereof, one of said delivery tubes being connected beneath one of each of said outer openings;

a plurality of pocket distributors formed with a wall about a portion of each of said outer openings;

a pair of paddles attached to and extending outwardly from the central core of said auger near said upper end, said paddles rotating with said auger to pass in close proximity to at least one end of each pocket distributor, said paddles cooperating with the flights of said auger to move said substance centrifugally outwardly along said bottom plate into said pocket distributors; and

a sweep member extending rearwardly from each paddle, said sweep member having a side passing in close proximity to said pocket distributors thereby retaining near said pocket distributors said substance rebounding from said distributors.

4,462,551

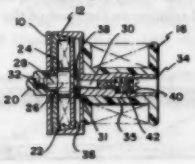
RETRACTIBLE FLY TYING BOBBIN

Paul Bloch, 109 Greenvillage St., Moodus, Conn. 06469

Filed Aug. 13, 1982, Ser. No. 407,899
Int. Cl.³ B65H 49/06, 81/00; A01K 81/00
U.S. Cl. 242—7.19 7 Claims

1. A fly tying bobbin comprising a frame, a housing rotatably mounted on a shaft which is fixed to said frame and is comprised of two cupped shaped cylindrical halves wherein one half is driven having the outside diameter of its cylindrical section slope inwardly from its base and the other half is the driver having the inside diameter of its cylindrical section slope outwardly from its base, a thread reel affixed to said housing, a tubular guide fixedly mounted on said frame which

is axially perpendicular to the axis of the thread reel, means located in said housing for keeping tension on thread being



dispensed from said thread reel, and means for quickly relieving all the thread tension when desired.

4,462,552

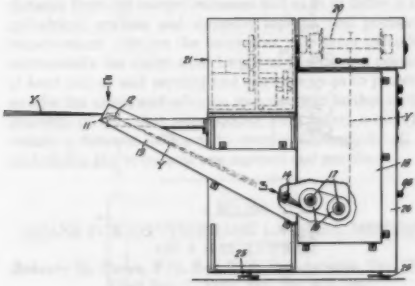
YARN BOBBIN WINDING MACHINE

Vincent A. Iannucci, West Lawn, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 379,524, May 19, 1982, abandoned. This application Aug. 1, 1983, Ser. No. 518,979

Int. Cl.³ B65H *54/02, 54/28, 57/28*

U.S. Cl. 242—42 **3 Claims**



1. A high speed winder for winding multiple yarn ends onto a flanged bobbin, said winder comprising:

(a) a frame;

(b) bobbin receiving means to hold the bobbin in position for rotation to receive multiple yarn ends thereon;

(c) traversing means including a yarn guide roll and a yarn guide beak mounted adjacent the bobbin when it is held by said receiving means, said yarn guide beak being elongated so that the end adjacent the bobbin is in contact with the yarn package;

(d) driving means connected to said bobbin receiving means and to said traversing means to effect operation thereof; and

(e) yarn guiding means receiving the multiple yarn ends from a source and directing the multiple yarn ends to said yarn guide roll on said traversing means, said yarn guiding means being spaced from said yarn guide roll a distance such that the enclosed lash angle of the multiple yarn ends between said guiding means and said guide roll is not more than 20° during a full sweep of said traversing means between its extreme positions along the bobbin.

4,462,553

ENDLESS CASSETTE TAPE FOR VIDEO TAPE RECORDER

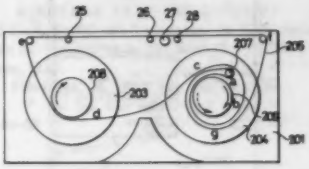
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,462

Claims priority, application Japan, Jun. 4, 1981, 56-86025

Int. Cl.³ G11B *23/06*

U.S. Cl. 242—55.19 A **6 Claims**



1. An endless tape cassette for a video tape recorder, comprising a tape supply reel and a take-up reel for supplying and taking up an endless tape, each reel having a reel hub respectively engageable with supply and take-up spindles on the recorder; a tape hook pin mounted on one of said reels, the endless magnetic tape being wrapped on said reel hubs to extend through a space between said tape hook pin and said reel hubs, said endless magnetic tape having a slack length corresponding to at least an amount of tape drawn out from the cassette in a tape loading mode, said endless tape being guided by said reels to smoothly travel in said cassette when said tape is driven, the slack being absorbed at high speed around said reel hubs by said tape hook pin in a tape unloading mode.

4,462,554

WEBBING LOCK DEVICE

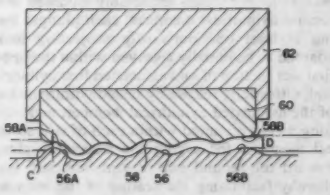
Toshio Gyoda, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 30, 1981, Ser. No. 325,866

Claims priority, application Japan, Dec. 3, 1980, 55-173618[U]

Int. Cl.³ A62B *35/02*

U.S. Cl. 242—107.2 **11 Claims**



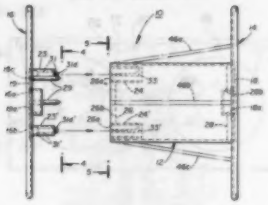
1. A webbing lock device wherein an intermediate portion of an occupant restraining webbing extending from a take-up shaft is clamped between a pair of clamping members to prevent the webbing from moving, characterized in that each of said clamping members has a corrugated surface on opposed sides thereof, and an interval between said corrugated surfaces during webbing clamping which progressively increases from one end of said pair of clamping members adjacent the take-up shaft toward another end of said pair of clamping members adjacent an occupant along the longitudinal direction of the webbing, said corrugated surface having corrugations each with a radius of curvature wherein the radius of curvature of the corrugations of said corrugated surface progressively increase from said one end of said pair of clamping members toward said another end of said pair of clamping members along said longitudinal direction of the webbing.

4,462,555

SPLIT REEL WITH QUICK-RELEASE FLANGE

John G. Olson, Westmont, and Joseph C. Kmiecik, Orland Park, both of Ill., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,290
Int. Cl.³ B65H 75/14
U.S. Cl. 242—118.6 **11 Claims**



6. A split reel adapted to facilitate the removal of a wound supply of elongated material en masse therefrom, comprising:

a cylindrical hub;

a first flange fixedly secured to a first end of said hub;

a circular end plate secured within a second end of said hub and formed with two diametrically disposed bores;

a pair of first cylindrical members each secured within a different one of said bores in said circular end plate, and extending inwardly of said hub toward said first end thereof, each of said first cylindrical members having at least one elongated detent-receiving slot formed therein, each slot including a first section that extends longitudinally from an outer end to a region inward of the inner end of the associated first cylinder, and a second section therein which extends a short distance circumferentially, with the terminating end thereof merging into a locking notch, said notch being oriented longitudinally, and extending a short distance toward the outer end, of said associated first cylindrical member;

a second flange;

a pair of second cylindrical members secured to said second flange and respectively positioned thereon so as to be telescopically received within different ones of said pair of first cylindrical members;

separate plunger means retractably mounted in each of said second cylindrical members, each plunger means including at least one outwardly projecting locking detent adapted to be initially received within the open end of the first slot section of said associated first cylindrical member and, ultimately, releasably seated within the locking notch of the associated cylindrical member, and

biasing means mounted within each of said second cylindrical members for urging the associated plunger therein toward the second end of said hub, said biasing means thereby facilitating the seating of the associated locking detent, under spring bias, within the locking notch of said associated first cylindrical member so as to effect the releasable locking of said second flange to the second end of said hub.

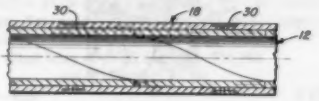
4,462,556

TUBE WITH REINFORCING STRIP

Woodrow W. Graham, Jr., Bennettsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Mar. 31, 1983, Ser. No. 481,028
Int. Cl.³ B65H 75/10
U.S. Cl. 242—118.31 **9 Claims**

1. A carrier tube for textile yarn or the like comprising a multiple ply construction including a base defined by at least one base ply, a tube reinforcing ply surrounding said base and being adhesively bonded thereto, said reinforcing ply being wound about said base and having opposed edges meeting in mutual substantial abutment with each other, an edge portion adjacent and along the length of each edge, a recess in and along each edge portion, the recesses in the edge portions combining to define an elongated channel, said channel being outwardly directed relative to the base of the tube, a reinforcing strip extending along and within said channel, said strip being received in each of said opposed recesses and being bonded therein to the corresponding edge portions, and at least one surface-defining ply wound in surrounding relation to said reinforcing ply and said reinforcing strip.

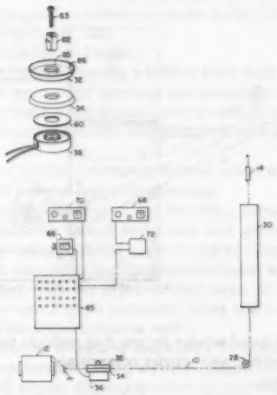


4,462,557

SPRING BIASED ELECTROMAGNETICALLY CONTROLLED TENSION CONTROL

Charles E. Warner, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 18, 1982, Ser. No. 434,900
Int. Cl.³ B65H 59/16, 59/18; D01H 13/10
U.S. Cl. 242—150 M **2 Claims**



1. A magnetically controlled tension apparatus for a running length of yarn comprising: an electromagnet, a post member mounted on said electromagnet and projecting upwardly therefrom, a first dish shaped member freely mounted over said post, a second dish shaped member freely mounted over said post in contiguous relationship with said first dish shaped member, each of said dish shaped members having a flange portion on the outer extremity of the dish shaped member, said first dish shaped member having its flange projecting upwardly, said second dish shaped member having its flange projecting downwardly towards said electromagnet, said electromagnet exerting a downward force on said dish shaped members when a voltage is applied thereto and a spring biasing means on said post between said electromagnet and said dish shaped members to exert an upward force on said dish shaped members in opposition to the downward force of said electromagnet.

4,462,558

YARN PACKAGE AND METHOD AND APPARATUS FOR PRODUCING THE SAME

Gerd Stahlecker, Geislingen-Stötten, and Hans Braxmeier, Suessen, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Mar. 2, 1983, Ser. No. 471,514

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209847

Int. Cl.³ B65H *55/00, 55/04, 54/32*

U.S. Cl. 242—178 13 Claims

1. A yarn package comprising a cylindrical yarn carrier having a yarn wound thereupon in layers, with at least the majority of the layers being of decreasing axial length as the distance from the carrier increases and so as to define a central cylindrical portion and opposite tapered end portions, the improvement wherein the outermost yarn layer extends over substantially the entire axial length of said central portion and at least one of said tapered end portions so as to protectively overlie the same, and wherein said package further includes a plurality of extended intermediate yarn layers which extend axially a distance sufficient to overlie substantially all of the underlying layers on said one tapered end portion.

4,462,559

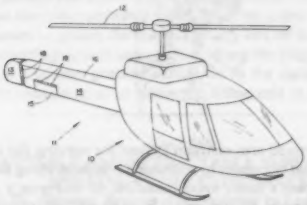
MEANS FOR CONTROLLING LATERAL MOVEMENT OF A HELICOPTER

Roberto M. Garza, P.O. Box 7036, San Antonio, Tex. 78207

Filed Sep. 7, 1982, Ser. No. 415,580

Int. Cl.³ B64C *27/00*

U.S. Cl. 244—17.19 16 Claims



1. A new means for controlling the lateral movement of a helicopter by an operator comprising:

a. a cabin;

b. a tail section extending from said cabin including a shroud, a tail aileron below said shroud and a rudder vertically hinged to one end of said tail aileron;

c. a rotatable support boom below said shroud extending rearward from said cabin and supported within one or more bushings, wherein said bushings are connected to said shroud and said support boom is connected to said tail aileron for pivoting said tail aileron;

d. a pair of pedals located within said cabin;

e. a pair of aileron cables each of which is attached at a first end to one of said pedals and at a second end to either side of said support boom for directly pivoting said tail aileron; and

f. means for pivoting said rudder simultaneously with the pivoting of said tail aileron.

4,462,560

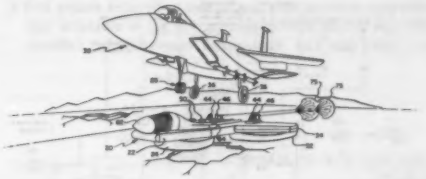
AIRPLANE TAKE-OFF SYSTEM

T. Desmond Earl, Buffalo, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 26, 1982, Ser. No. 341,459

Int. Cl.³ B64F *1/10*

U.S. Cl. 244—63 1 Claim



1. An air cushion vehicle sled for allowing an aircraft to take-off from a damaged runway, said sled comprising:

a hull having a generally T-shaped configuration in plan view to present a relatively narrow forward portion and laterally projecting rearward portions;

a forward air cushion cell carried by said hull below said forward portion and having a diameter substantially corresponding to the width of said forward portion of said hull;

a pair of substantially identical rearward air cushion cells carried by said hull below said rearward portions thereof, said rearward cells being disposed in closely spaced, side-by-side relation and each having a diameter substantially greater than the diameter of said forward cell and sufficient to extend to the outer end of said rearward portion of said hull, said forward and rearward cells being relatively disposed such that the three wheels of a tricycle landing gear aircraft are adapted to be substantially centered over the respective cells when said aircraft is supported on said hull;

retaining means on said hull centered above each of said cells for releasably holding the three wheels of the tricycle landing gear aircraft;

mutually aligned wheel guide track means disposed of said hull and aligned with each of said retaining means for accommodating the wheels of the aircraft when mounting the sled and guiding the wheels into positions over said air cushion cells and adjacent said each retaining means;

means located at the forward end of said forward portion of the hull for delivering pressurized air into said cells and including rearwardly directed and divergent nozzles located to either side of that retaining means centered above said forward cell, each nozzle having independently operable closure means for constraining the pressurized air to be fed to said cells when the closure means is closed and for by-passing flow of air to said cells and allowing it to pass through the nozzle when the closure means is open for use in directional control of the travel of said sled following aricraft separation;

drag chute means carried adjacent the rear end of said rearward portion of the hull and normally stowed in housings mounted thereon, said chutes being releasably actuated automatically upon separation of said aircraft from said sled for retarding further travels of said sled; and

means adapted to be controlled by aircraft personnel for

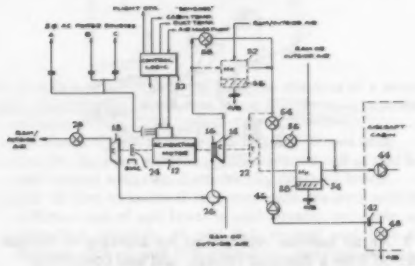
releasing said retaining means to permit said aircraft to fly away from said sled.

4,462,561

ENERGY EFFICIENT ECS POWERED BY A VARIABLE VOLTAGE/VARIABLE FREQUENCY POWER SYSTEM

Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed May 27, 1982, Ser. No. 382,491
Int. Cl.³ B64D *13/08, 13/02*
U.S. Cl. 244—118.5 **1 Claim**



1. In an aircraft having at least one engine, an auxiliary power unit and an environmental control system having a boot-strap cooling system including a main cabin compressor driven by an induction motor, said motor capable of running in a two- or four-pole configuration, the method of controlling the output of said compressor comprising the steps of:

providing an external electrical power at a first-frequency and first-voltage level to said induction motor in said two-pole configuration causing said compressor to run at a first RPM when said engine and said auxiliary power unit are off;

providing electrical power from said auxiliary power unit at a second frequency and second voltage both double said first frequency and voltage to said induction motor in said four-pole configuration causing said main cabin compressor to run at said first RPM;

providing electrical power at said first frequency and said first voltage level from said engine running at approximately 50% operating RPM to said induction motor in said two-pole configuration causing said main cabin compressor to run at said first RPM;

providing electrical power from said engine running at maximum operating RPM at taking off and climbing at said second frequency and said second voltage level to said induction motor in said four-pole configuration causing said compressor to run at said first RPM;

providing electrical power from said engine running at maximum operating RPM at altitude and cruise at said second frequency and said second voltage level to said induction motor in said two-pole configuration causing said main cabin compressor to run at a second RPM twice said first RPM; and

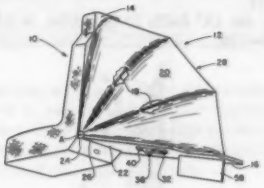
providing a supercharging compressor in series with said main cabin compressor when said engine RPM is reduced between 10 and 20 percent and said second frequency and second voltage level is reduced proportionately, said supercharging compressor making up any loss of output from said main cabin compressor due to a reduction in RPM when said aircraft is descending from altitude.

4,462,562

SELF-DEPLOYING AFTERBODY APPARATUS FOR AN EJECTION SEAT

Edwin R. Schultz, Waynesville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 14, 1982, Ser. No. 418,117
Int. Cl.³ B64D *25/10*
U.S. Cl. 244—122 A **8 Claims**



1. A self-deploying afterbody apparatus for an ejection seat of an aircraft, comprising:

(a) a cover plate pivotally mounted at one end to a back side of said ejection seat;

(b) a plurality of semi-elliptical stiffeners pivotally mounted at their bases to said back side of said seat and located between said cover plate and seat;

(c) a skin of material extending between and interconnecting said cover plate and seat, and covering said semi-elliptical stiffeners so as to form, upon movement of said plate, an expandible and collapsible, semi-elliptical cross-sectional shaped afterbody structure which reduces aerodynamic drag forces on said seat and thereby stabilizes the same following ejection from an aircraft; and

(d) means for causing movement of said plate and thereby deployment of said bellows-like structure during ejection of said seat.

4,462,563

SIMPLE NONRESTRICTIVE ARM RESTRAINT SYSTEM

Lawrence J. Specker; Thomas J. Jennings, both of Dayton, and Michael P. Connors, Beavercreek, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 8, 1982, Ser. No. 433,597
Int. Cl.³ B64D *25/02*
U.S. Cl. 244—122 AG **3 Claims**

1. An improved arm restraint system for moving the arms of an ejection seat occupant to restrained positions along the sides of the occupant's torso upon initiation of emergency escape ejection of the seat and occupant from an aircraft, comprising, for each arm of the occupant:

(a) first means for pulling the corresponding arm, at the wrist thereof, toward said restrained position, said first means including a fixed flexible strap connected at first and second fixed points to the corresponding arm respectively adjacent to the wrist and elbow thereof and a movable guide ring adapted to slide along said fixed strap between said first and second points and being interconnected to a fixed location on said aircraft; and

(b) second means for pulling said arm, at the elbow thereof,

toward said restrained position, said second means including a fixed guide ring connected at a third fixed point to the corresponding arm located adjacent to said second fixed point and thereby the elbow of said arm and a movable flexible strap connected at one end to said movable guide ring of said first means, extending through said fixed guide ring, and interconnected at the other end to a fourth fixed point located on the corresponding side of the occupant's torso;

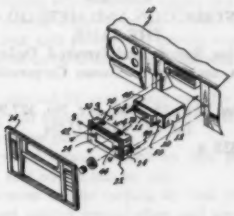
(c) said connection of said movable guide ring of said first means and said movable flexible strap of said second means together and with said fixed location on said aircraft and with said fixed point on the side of the occupant's torso through said fixed guide ring of said second means causing the wrist and elbow of said arm to be pulled simultaneously toward said restrained position during ejection of said seat and occupant from said aircraft.

4,462,564

CONVERSION KIT FOR MOUNTING A RADIO SUBSTITUTED FOR ORIGINAL RADIO IN AUTOMOTIVE VEHICLES

Roger J. Alves, 2558 E. Lynwood St., Simi Valley, Calif. 93065, and Daniel W. Reyes, 10814 Chimineas St., Northridge, Calif. 91324

Filed Apr. 27, 1983, Ser. No. 489,245
Int. Cl.³ G12B *9/00*
U.S. Cl. 248—27.1 **13 Claims**



1. A conversion kit for mounting an accessory such as a radio, in a cavity defined by a dash structure of a vehicle, the kit comprising:

(a) a frame unit having a front mounting panel, the front mounting panel defining at least one opening to receive at least a part of the accessory, the frame unit also having top, bottom, and end members extending rearwardly from the mounting panel, at least one of the members defining a plurality of rearwardly extending slots; and,

(b) at least one mounting bracket having a first portion with means to attach the bracket to any one of the rearwardly extending slots at any position along the length of the slot, and a second portion attachable to the dash structure of the vehicle so as to retain the frame unit in the cavity.

4,462,565

ERECTABLE AND RETRACTABLE SUPPORT FOR ROLLING CONDUCTOR TRACK

George W. Johnson, Smyrna, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jan. 17, 1983, Ser. No. 458,357
Int. Cl.³ F16L *3/00*
U.S. Cl. 248—51 **5 Claims**

1. An erectable and retractable support device that is connectable to a segmented rollable conductor track assembly that carries conductors between a fixed station and a movable station mounted to a machine movable relative in the fixed station wherein the conductors remain connected between the fixed and movable stations regardless of the location of the machine relative to the fixed station, said support device comprising:

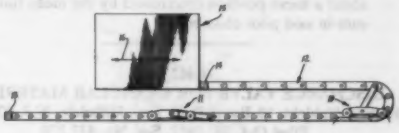
a pair of side member assemblies, laterally spaced in fixed relation to each other, with each side member assembly having a pair of wheels departing therefrom to form a rollable carriage assembly of a fixed tread;

a torque-tube member rotationally mounted to each of the side member assemblies proximate each end of the torque-tube member;

a pair of elongated crank arm members each having one end fixedly secured to the torque-tube member proximate an end thereof, both of the crank arm members extending from said torque-tube member in a common direction and the other end of each crank arm member pivotably connected to a segment of the conductor track assembly;

a cam plate member fixedly secured to said torque-tube member for rotation therewith and having a first and a second circumferential slot thereon;

a first means secured to one of said side member assemblies and locatable in the first circumferential slot of said plate member whereby said torque-tube and said crank arm



members may rotate between a retracted position and an erected position that is substantially perpendicular to a path of travel of the carriage assembly, the rotation of the torque-tube and plate members occurring by the movement of the ends of the crank arms pivotally connected to track assembly segment moving from a flat position to an elevated position for erection of the support device as well as corresponding movements in the reverse direction for retraction of the support device;

and a second means pivotally secured to said one of said side member assemblies, said second means including a lock member biased into locked engagement with the second circumferential slot on said plate member when the crank arms are in their upright position whereby said support device is locked in an erected position, said second means further including a means for tripping the lock member out of engagement with the second circumferential slot as the tripping means is mechanically activated by engagement with a portion of the track assembly that is intermediate of and moving from an elevated position to a flat position.

4,462,566

PRESSURE COMPENSATED FLOW CONTROL SYSTEM

Bruce C. French, R.R. #2, Caledon East, Ontario, Canada L0N 1E0.

Filed Feb. 8, 1982, Ser. No. 347,065
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—30 **17 Claims**

1. A flow control valve for hydraulic fluids comprising:

a valve housing providing an inlet port for connection to a pressurized fluid supply and an outlet port for connection to a fluid line;

a valve member slidably positioned in said housing,

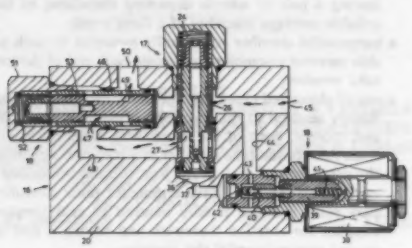
the valve member cooperating with said inlet and outlet ports to define a variable flow passage therebetween;

means resiliently biasing the valve member towards a first position at which it closes said variable flow passage,

the valve housing further providing a pilot chamber having a connecting port for connection to a pulsating fluid supply,

the valve member having one face exposed to fluid pressure

in said pilot chamber and being displaceable thereby against the bias of said biasing means for opening said variable flow passage; and



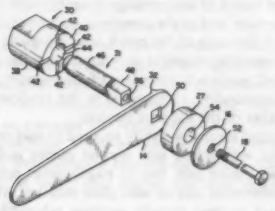
bleed means communicating with said pilot chamber for bleeding fluid therefrom whereby, in operation of the valve, the valve member is maintained in a state of dither about a mean position determined by the mean fluid pressure in said pilot chamber.

4,462,567

DISCHARGE VALVE FOR GRANULAR MATERIALS

Helmut Habicht, 15 Royal Park Ter., Hillsdale, N.J. 07642

Filed Oct. 28, 1982, Ser. No. 437,270
Int. Cl.³ F16K *31/528, 1/22*
U.S. Cl. 251—297 **2 Claims**



1. A discharge valve for granular materials and the like, comprising:

a metallic valve body having a pair of circumferential ledges disposed in spaced relation therewithin;

a metallic disc and means for pivotally supporting the disc within the valve body including a first pivot extending from one side of the disc and a second pivot extending from the opposite side of the disc, a first bushing extending through one side of the valve body and a second bushing extending through the opposite side of the valve body, first means extending through the first bushing and engaging the first pivot, and second means extending through the second bushing and engaging the second pivot;

a handle and means for coupling the handle to the supporting means, with the handle being operable for opening and closing the valve, said handle coupling means including one of the first and second bushings being adapted for receiving a stem having a portion extending beyond said one bushing and external to the valve body, the extending portion of the stem being adapted for receiving the handle, and one of the first and second means extending through the handle and the stem and engaging one bushing for coupling the handle to said bushing;

the disc having a surface abutting one of the circumferential ledges and an opposite surface abutting the other of the ledges to provide a metal-to-metal seal when the valve is fully closed, the handle being operable for pivoting the disc away from the ledges to open the valve and to pivot the disc toward the ledges for closing the valve; and

the means for coupling the handle to the supporting means including means for varying the degree to which the disc is pivoted to open and close the valve, said varying means including the one bushing have a face carrying a plurality of detents extending radially from the center to the outer edge thereof, the handle having a protrusion, and a resilient member engaged by the one of the first and second means biasing the handle against the face of the one bushing so that upon exertion of a rotating force on the handle the handle protrusion selectively engages one of the plurality of detents to vary the degree to which the disc is pivoted to open and close the valve; and

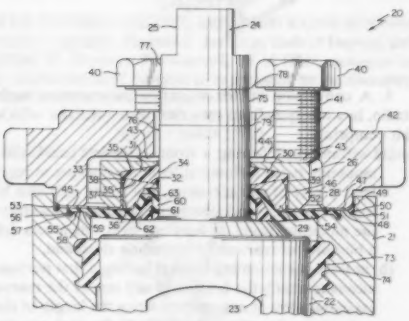
the resilient member being a disc-like member of a relatively resilient material and having a hole extending therethrough, the handle sandwiched between the resilient member and the one bushing with the resilient member having a side abutting the handle, a retaining washer having a hole extending therethrough disposed on the one side of the resilient member opposite the side thereof abutting the handle, and the one of the first and second means extending through the handle and the stem and engaging the one bushing for coupling the handle to said bushing extending through the holes in the resilient member and the retaining washer.

4,462,568

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Charles W. Taylor, Batavia, and Everett J. DeJager, Cincinnati, both of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed Mar. 15, 1982, Ser. No. 357,974
Int. Cl.³ F16K *31/44*
U.S. Cl. 251—335 A **25 Claims**



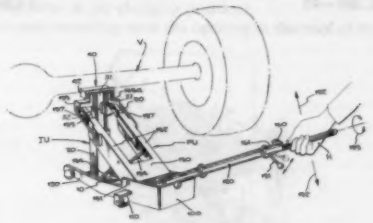
1. In a valve construction comprising a housing means having a valve chamber therein, a valve means rotatably carried by said housing means in said chamber thereof and having a valve stem extending from said chamber, and seal means carried by said housing means to prevent leakage from said chamber to the exterior of said housing means and having an annular seal member sealing against and completely around said stem while permitting rotational movement therebetween, the improvement wherein said seal means comprises a pair of annular metallic retainers press-fitted together in telescoping relation and holding said annular seal member therebetween in compressed sealed relation therewith, said retainers having annular facing surfaces compressing said seal member therebetween, and said facing surfaces being disposed to generally taper toward each other in a direction substantially transverse to and away from said stem.

4,462,569

APPARATUS FOR JACKING UP AND SUPPORTING A STRUCTURE

Harry H. Arzouman, Los Angeles, Calif., assignor to Safe T Jack, Inc., Santa Fe Springs, Calif.

Filed May 7, 1981, Ser. No. 261,686
Int. Cl.³ B66F *5/04*
U.S. Cl. 254—8 B **20 Claims**



1. A two-part jack system comprising, in combination: an extendible jack stand having a horizontal bottom plate, a horizontal top plate, a pair of vertically disposed telescoping members attached to corresponding ones of said plates, and ratchet means carried by said telescoping members for releasably locking said members in a selected position of longitudinal extension;

a power unit having wheel support means and adapted to be selectively moved towards or away from the vicinity of said jack stand, said power unit having expansible lifting means adapted to be inserted between said plates of said jack stand;

power means carried by said power unit for expanding or contracting said expansible lifting means to thereby raise or lower said top plate;

manually operated means carried by said power unit for controlling said power means; and

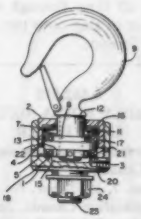
manually operated means carried by said power unit for releasing said ratchet means when said top plate is to be lowered.

4,462,570

HOIST OVERLOAD LIMITER

Thomas R. Gagnet, Moneta, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Aug. 25, 1982, Ser. No. 411,501
Int. Cl.³ B66D *1/48, 5/26*
U.S. Cl. 254—268 **5 Claims**



1. A load limiting device for suspending a pneumatically driven hoist having a brake which is normally set and is released by a pneumatic brake signal only on activation of the hoist in its raising or lowering mode comprising: a hoist suspending hook

a load sensing means suspending said hoist and communicating with the pneumatic brake signal to disable said signal on an overload condition and thereby prevent release of the brake and operation of the hoist, said load sensing means including a venting means

a chamber containing a spring means and a sealing means, said spring means biasing said sealing means whereby said sealing means prevents venting of said pneumatic brake signal during operation with normal loads and permits venting of said pneumatic brake signal on overload,

said sealing means is connected to the hoist suspending hook through a bearing means mounting said load sensing means to function as a hook swivel having unlimited rotation; and

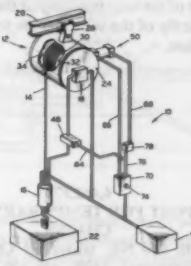
said load sensing means including a spring means adjusting means to effect the desired release of the sealing means.

4,462,571

FLUID-OPERATED, LOAD-HANDLING APPARATUS

Albert D. Fox, Novi, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Filed Feb. 24, 1982, Ser. No. 351,943
Int. Cl.³ B66D *1/08, 1/48*
U.S. Cl. 254—270 **14 Claims**



1. Load-handling apparatus comprising a fluid-operated hoist having a chamber and a piston, elongate means moved by said piston and extending downwardly from said hoist for urging a load in one direction when fluid pressure applied to the chamber exceeds a particular value and for being urged by the load in another direction when the pressure applied to the chamber is less than a particular value, a pilot fluid-controlled regulator for applying fluid pressure to said chamber in response to pilot fluid pressure applied to said regulator, and a load-responsive pilot fluid regulator for supplying pilot fluid to said pilot fluid-controlled regulator for increasing pressure of pilot fluid to said pilot fluid-controlled regulator when the load is heavier than a load which was previously carried by said elongate means and for decreasing the pressure of pilot fluid to said pilot fluid-controlled regulator when the load is lighter than a load which was previously carried by said elongate means.

4,462,572

FENCE STAY

Robert L. Hanneken, Rte. 1, Box 110, Verona, Mo. 65769

Filed Sep. 1, 1982, Ser. No. 413,818
Int. Cl.³ B21F *27/00*
U.S. Cl. 256—52 **9 Claims**

1. A fence stay for use in fixedly spacing strands of any kinds of wire fencing includng smooth, barbed and woven wire strung between posts, the fence stay comprising an elongated strip of rigid sheet material having a pair of angularly related leg portions terminating in rolled edges lying in a first plane intersecting said leg portions, and a bight portion connecting the leg portions, a series of longitudinally spaced, transversely arranged slots along the length of the strip, said slots being open to the bight portion of the strip for receiving strands of wire fencing, the slots being inclined upwardly and inwardly from the bight portion and terminating in a second plane inter-

secting the legs and located between the bight portion and said first plane of the rolled edges of the strip and being spaced about 2 inches apart along the length of the strip to facilitate placing wires in selected slots at a desired spacing of the wires

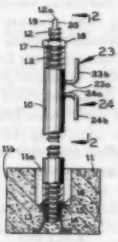
and means including a length of wire attached to and extending along the length of the strip inwardly of the open portion of the slots and outwardly of the wire strands for retaining the wire strands in the slots.

4,462,573

SUPPORT POST FOR TEMPORARY GUARD-RAIL CHAINS

Samuel T. Melfi, 520 NE. Wavecrest Ct., Boca Raton, Fla. 33432, and Nicholas J. Melfi, 680 SW. 14th St., Deerfield Beach, Fla. 33441, assignors to Samuel T. Melfi; Anna J. Melfi, both of Boca Raton and Nicholas J. Melfi, Deerfield Beach, all of, Fla., a part interest

Filed Aug. 22, 1983, Ser. No. 525,292
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—65 **11 Claims**



1. In a support post for a temporary guard-rail chain at a concrete floor on a building under construction, said post having a screw-threaded rod for screw-threaded insertion in a nut embedded in the floor, said rod being screw-threadedly removable from said nut after use, the improvement which comprises:

a pair of hooks on one side of said post positioned close enough to each other for engagement by closely-spaced different links of the same temporary guard-rail chain to attach the chain to the post;

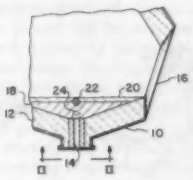
and a clamping nut threadedly adjustable on said screw-threaded rod to clamp said post in a position in which said hooks are on the side of the post facing away from the periphery of the floor.

4,462,574

METHOD FOR MINIMIZING SLAG CARRYOVER

William M. Keenan, Pittsburgh; Sheldon McGarry, Penn Township, Westmoreland County, and James G. Bassett, Jr., Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 376,800, May 10, 1982. This application Jun. 21, 1983, Ser. No. 506,557
Int. Cl.³ C21C *5/46*
U.S. Cl. 266—45 **5 Claims**



1. A method of minimizing slag carryover from draining molten metal from a furnace through a taphole therein, said method comprising:

dropping a polyhedral-shaped body onto the surface of molten slag and metal in said furnace within a restricted area above said taphole so as to insure that said body will be drawn into the taphole as a final portion of metal drains out of the furnace,

said body having a cross-section of minimum dimension greater than the maximum dimension of the cross-section of the opening of said taphole,

said body having a density intermediate that of the molten metal and slag in said furnace,

said body being substantially resistant to dissolution in the molten metal and slag so as to retain minimum cross-sectional dimensions greater than the taphole opening for a time sufficient to assure the body will lodge in the taphole opening,

said body having equilateral generally planar faces, the intersections of which are adapted to lodge in the taphole without completely blocking the taphole opening,

said body having dimensions for blocking between 20 to 80 percent of the taphole opening when an intersection thereof becomes lodged centrally in said taphole opening,

draining molten metal from the furnace through the taphole opening,

monitoring the condition of the stream emanating from said taphole so as to obtain an indication of flaring of said stream when said body lodges therein,

and then shutting off flow through said taphole so as to prevent carryover of slag onto the molten metal already tapped from the furnace.

4,462,575

HOOD ASSEMBLY FOR A METALLURGICAL CONVERTER

William R. Kallio, Noranda, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed Jan. 7, 1982, Ser. No. 337,831
Claims priority, application Canada, Jan. 29, 1981, 369679
Int. Cl.³ C21C *5/38*
U.S. Cl. 266—158 **6 Claims**

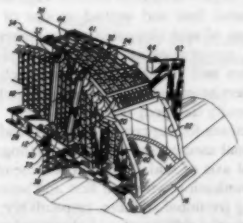
1. A hood assembly having a front, rear, upper and lower portions, for use with a metallurgical converter having a mouth surrounded by an apron plate and able to rotate from a blowing position to a charging and skimming position, comprising:

(a) a supporting structure;

(b) a hood resting on said supporting structure and having sidewalls with upper and lower ends, said lower ends ex-

tending downwardly to a short distance from the apron plate and around a portion of the periphery of the converter corresponding to the angular movement of the mouth of a converter from the blowing to the charging position, and said upper ends following a curvelinear or straight path which extends from the upper back end of the hood until it meets with said lower ends of the sidewalls at the front of the hood, and a roof bridging the sidewalls except for an opening at the front of the hood extending over the mouth of the converter in the charging position;

(c) a gate extending over the opening in the roof of the hood;



(d) a pair of lifting arms located on each side of the hood, the arms of each pair having their lower ends pivotally mounted a first distance apart on said supporting structure and having their upper ends pivotally connected to the edges of the gate at a second distance apart, for pivoting said gate in a convex curved path from a closed position over the opening of the roof to an open position over the roof of the hood, said convex curved path generally following the upper ends of said sidewalls with a minimum of clearance space between said gate and said roof of the hood; and

(e) means associated with said gate for moving said gate from a closed to an open position and vice-versa for providing access to the mouth of the converter.

4,462,576

APPARATUS FOR SUPPLYING GAS THROUGH THE WALL OF A METALLURGICAL CONTAINER

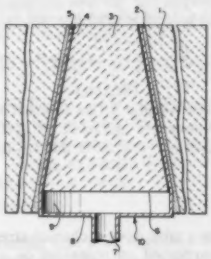
Alfried Hohberg, Essen, and Udo Muschner, Tönisvorst, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 467,193

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206499; Dec. 23, 1982, 324716

Int. Cl.³ C21C 5/34

U.S. Cl. 266—220 **23 Claims**



1. An apparatus for supplying gas through the wall of a metallurgical container, said apparatus comprising:

a fireproof refractory brick having a free inner end adapted to be exposed to the interior of a metallurgical container, an outer end opposite said inner end, and a peripheral area extending between said outer and inner ends;

a metal cover surrounding said peripheral area;

means for supplying gas to said outer end of said brick; and

gas passage means, extending from said outer end of said brick to said inner end thereof, for supplying said gas to the interior of the metallurgical container, said gas passage means comprising at least one gas passage completely filled with fireproof ceramic fiber material extending between said outer and inner ends of said brick.

4,462,577

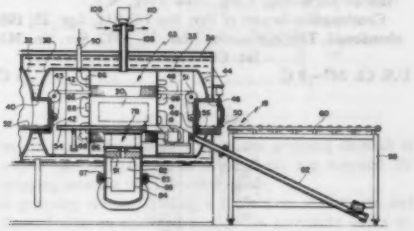
APPARATUS FOR GAS COOLING WORK PARTS UNDER HIGH PRESSURE IN A CONTINUOUS HEAT TREATING VACUUM FURNACE

Herbert W. Westeren, Barrington, R.I., assignor to C.I. Hayes Inc., Cranston, R.I.

Filed Dec. 16, 1982, Ser. No. 450,312

Int. Cl.³ C21D 9/00

U.S. Cl. 266—250 **7 Claims**



1. A vacuum furnace for processing work parts in a heating chamber for the heat treatment thereof, comprising means for introducing work parts into said heating chamber during a heat treatment cycle, means for sealing said heating chamber for heat treating said work parts under a predetermined vacuum and temperature therein, a cooling chamber located in close proximity to said heating chamber and being selectively disposed in communication therewith, means for transferring said work parts from said heating chamber to a cooling station in said cooling chamber after said heat treatment cycle for the rapid cooling of said work parts prior to the discharge thereof from said cooling chamber, and means for rapidly cooling said work parts at said cooling station without the immersion thereof in a cooling fluid, said cooling means including an open-ended cylindrical cage located in said cooling chamber, and defining the cooling station therein and in which said work parts are moved from said heating chamber for the rapid cooling thereof, a high velocity impeller located in said cooling chamber for rapidly circulating a pressurized cooling gas within said cage for movement over and around said work parts for the rapid cooling thereof, and heat transfer members disposed in said cooling chamber over which said cooling gas is directed by said impeller after contact thereof with said work parts for withdrawing heat therefrom prior to recirculation into contact with said work parts, said cooling means further including a closed fluid system through which a cooling fluid is recirculated, said cooling gas being circulated by said impeller into contact with said heat transfer members for transfer of heat therefrom and for maintaining said cooling gas at a temperature that is sufficiently low enough to cool said work parts at said cooling station within a limited period of time, said furnace further comprising a discharge compartment communicating with said cooling chamber on the downstream side thereof, an interior exit door mounted on said load discharge compartment for controlling access of a load therefrom following a cooling cycle, means for removing work parts from said cooling chamber for transfer to said discharge compartment after the cooling cycle for discharge from said furnace, means for controlling the operation of said interior exit door to permit the discharge of said work parts through said

discharge compartment, said interior exit door being responsive to the pressurized cooling gas thereagainst within said cooling chamber to maintain a sealed position relative to said discharge compartment during the cooling cycle, an exterior exit door mounted on the exterior end of said discharge compartment and cooperating with said interior exit door to seal the cooling chamber during the cooling cycle, and means for laterally sliding said exterior exit door to and from the closed position thereof, said exterior exit door remaining in a close position without the use of special clamping means therewith when said interior exit door is sealed against said discharge compartment by the pressurized cooling gas during the cooling cycle, and being forced into positive sealing position against the discharge compartment when said cooling chamber is under vacuum.

4,462,578

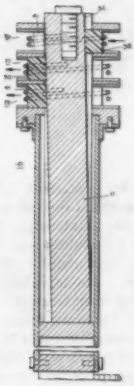
SHOCK ABSORBERS

Thomas M. Camilleri, New York, N.Y., assignor to Sycam Advanced Technology Corp., New York, N.Y.

Continuation-in-part of Ser. No. 143,811, Apr. 23, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,080

Int. Cl.³ F16F *13/02*

U.S. Cl. 267—9 C **16 Claims**



1. A vehicle shock absorber for damping mechanical motion between vehicle body and axle members with respect to one another, the vehicle body and axle members moving along respective predetermined paths with respect to each other, the shock absorber being of the type wherein frictional retardation forces are produced in directions opposing the mechanical motion between the vehicle body and axle members, the shock absorber further comprising:

elongated rod member means having a longitudinal axis, said elongated rod member means further having a plurality of continuously sloping frictional surfaces, each arranged in a corresponding one of at least first and second inversely tapering groups of said sloping frictional surfaces, said frictional surfaces extending continuously substantially coextensively with one another along said longitudinal axis, and coextensive with a maximum excursion of said elongated rod member means, each of said sloping frictional surfaces being displaced from said longitudinal axis by a respective displacement distance which varies in accordance with a selectable one of at least first and second predetermined displacement functions for correlating distances along said longitudinal axis with said respective displacement distance throughout said longitudinal coextension with remaining ones of said sloping frictional surfaces in said corresponding group of said sloping frictional surfaces;

at least first and second groups of frictional members, each of said groups of frictional members being adapted to apply a corresponding one of the frictional retardation forces to a respectively associated one of said first and second groups of said sloping frictional surfaces, each of said frictional members having a length along said longitudinal axis which is substantially shorter than said longitudinal coextension of said sloping frictional surfaces and maintaining a substantially constant frictional engagement area with said elongated rod member means throughout said longitudinal coextension as said elongated rod member means moves with respect to said frictional members;

first and second resilient means for frictionally communicating with and urging respective ones of said first and second groups of frictional members against said respectively associated first and second groups of sloping frictional surfaces of said elongated rod member means, said frictional communication including a sliding engagement between said resilient means and each of said frictional members having at least one sliding contact area and being frictionally damped; and

carrier means for supporting said first and second groups of frictional members substantially orthogonal to said longitudinal axis of said elongated rod member means, and in communication with said first and second groups of said sloping frictional surfaces, respectively, whereby longitudinally axial motion of said elongated rod member means in a first direction with respect to said carrier means causes predetermined ones of said resilient means to urge said first group of frictional members against said first group of sloping frictional surfaces to increase progressively one of the frictional retardation forces, and whereby longitudinally axial motion of said elongated rod member means in a second direction which is axially opposite to said first direction causes predetermined others of said resilient means to urge said second group of frictional members against said second group of sloping frictional surfaces to increase progressively a further one of the frictional retardation forces.

4,462,579

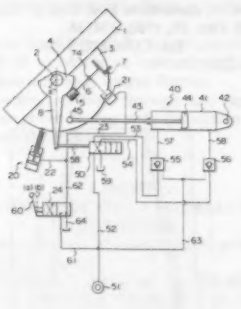
TILTING ROTARY TABLE DEVICE

Eishin Satake, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Ishikawa, Japan

Filed Mar. 25, 1982, Ser. No. 361,627

Int. Cl.³ B23Q *3/18*

U.S. Cl. 269—61 **11 Claims**



1. A tilting rotary table device, characterized in that a tilting rotary table is supported on trunnions on a base frame for tilting movement; a hydraulic servomechanism including a power cylinder having a piston rod with a free end and a hydraulic servocontrol valve having a stylus is mounted on said base with the free end of the piston rod thereof connected to said tilting rotary table; a worm wheel and a stylus operating arm are rotatably and loosely fitted on one of the trunnions of said tilting rotary table as a single unit; said worm wheel has a

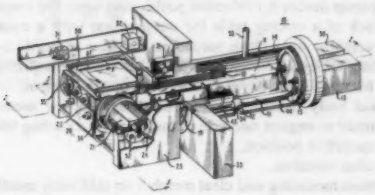
worm shaft and is adapted to be rotatively controlled to a desired inclination by means of a rotation control system controlling the worm shaft supported on said tilting rotary table; the stylus operating arm is adapted to be in contact wth the stylus of the hydraulic servocontrol valve and to attain the setting of said tilting rotary table for a desired inclination through the following--up action of said tilting rotary table resulting from rotative operation of said worm shaft; a hydraulic table clamping device is provided on the base for clamping the tilting rotary table relatively to the base; and a hydraulic worm shaft clamping device is mounted on said tilting rotary table for clamping said worm shaft.

4,462,580

HYDRAULICALLY DRIVEN X-Y STAGE

Robert J. Nielsen, Upper Black Eddy, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 2, 1981, Ser. No. 307,899
Int. Cl.³ B23Q *3/18*
U.S. Cl. 269—73 **13 Claims**



1. Apparatus for providing motion of a supporting member (30) in two essentially orthogonal directions comprising:

a pair of hydraulically driven cylinders (10 and 20) disposed with their longitudinal axes essentially orthogonal and coupled to said supporting member so that each independently drives said member in one of said directions, each of said cylinders including a carriage portion (12 and 22) slidably engaged over a rod (11 and 21) having flat surfaces (64), the supporting member (22) being mounted over the carriage of at least one of the cylinders;

means for preventing significant motion of the rod or carriage in a direction other than along their longitudinal axes comprising a plurality of hydraulic bearings (36) formed near the edges of each carriage facing each flat surface of the rod over which the carriage is engaged and adapted to produce a film of oil between the rod and carriage which provides stiffness to any deformation and which also prevents significant rotational motion of the rod or carriage in combination with the flat surfaces of the rod; and

means (14, 15, 41–44, and 24) for feeding oil into said cylinders.

4,462,581

VISE WITH CHANGEABLE GRIPPING ELEMENTS

Shigeto Mitani, 3921 W. 231st St., Torrance, Calif. 90505

Filed Jul. 23, 1982, Ser. No. 401,074
Int. Cl.³ B25B *1/24*
U.S. Cl. 269—283 **10 Claims**

1. A vise comprising:

two jaws;

means for actuating said jaws relatively toward and away from one another to grip a workpiece;

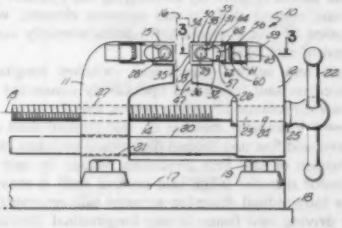
a gripping element carried by one of said jaws for contacting and gripping said workpiece;

said gripping element having a plurality of different work contacting faces configured differently for engagement with different types of workpieces, and being adapted to be turned relative to said one jaw to positions in which said different faces respectively face toward and grip the workpiece; and

two connections at opposite ends of said gripping element for attaching it to said one jaw;

one of said connections comprising a clamp at one of said ends of the gripping element actuable between an active condition in which it holds said gripping element in one of said positions thereof and a released condition in which said gripping element is free to turn between said different positions of the gripping element;

said clamp when in said active condition thereof being constructed to secure said gripping element to said one jaw in



any of said different positions of the gripping element in which said different faces respectively are exposed for gripping contact with the workpiece;

said gripping element having a projection at said one end thereof with an enlarged head at its extremity and a reduced diameter shank axially inwardly of the head;

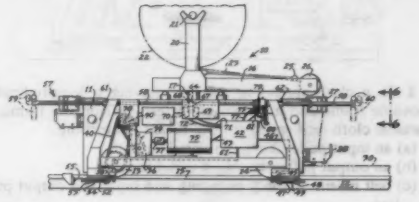
said clamp including a part having a slot within which said shank of said projection is received, with said slot having a reduced width portion narrower than said head within which the shank is received in said active condition of the clamp and an enlarged portion adapted to pass said head therethrough in said released condition of the clamp for detachment of said element from the clamp.

4,462,582

HANDLE CONTROL APPARATUS FOR CLOTH SPREADING MACHINE

Hoyt L. Smith, and D. Frank Farrar, Jr., both of Nashville, Tenn., assignors to Cutters Exchange, Inc., Nashville, Tenn.

Filed Aug. 9, 1982, Ser. No. 406,316
Int. Cl.³ B65H *29/46*
U.S. Cl. 270—3 **8 Claims**



1. In a cloth spreading machine having a frame supporting a spreading mechanism adapted to spread cloth upon a spreading surface as the frame moves longitudinally reciprocally over the spreading surface, handle control apparatus comprising:

(a) a motor operatively connected to said frame for driving said frame over said spreading surface;

(b) a speed control device operatively connected to said motor to vary the speed of said frame,

(c) said speed control device having an operator element adapted to actuate said speed control device to vary the

speed of said frame in response to the position of said operator element,

(d) motor directional reversing means operatively connected to said motor for driving said frame in one longitudinal direction or the other,

(e) an elongated control shaft having opposite end portions and an intermediate operator portion,

(f) means mounting said control shaft on said frame for rotatable and longitudinal reciprocal movement relative to the longitudinal axis of said control shaft,

(g) a handle member fixed to each end portion of said control shaft whereby said control shaft is manually rotated or longitudinally shifted,

(h) link means operatively connecting the operator portion of said control shaft to said operator element, whereby rotation of said control shaft commensurately varies the speed of said frame,

(i) first and second directional switches longitudinally spaced on said frame and operatively connected to said motor directional reversing means, and

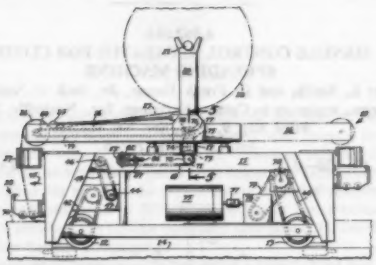
(j) a switch actuator member on said control shaft and between said first and second directional switches, whereby actuation of said first directional switch by said switch actuator member when said control shaft is moved in a first longitudinal direction actuates said reversing means for driving said frame in one longitudinal direction and actuation of said second directional switch by said switch actuator member when said control shaft moves in the opposite longitudinal direction actuates said reversing means to drive said frame in said other longitudinal direction.

4,462,583

VARIABLE CLOTH FEED SPEED CONTROL FOR CLOTH SPREADING MACHINE

Hoyt L. Smith, and D. Frank Farrar, Jr., both of Nashville, Tenn., assignors to Cutters Exchange, Inc., Nashville, Tenn.

Filed Aug. 26, 1982, Ser. No. 411,877
Int. Cl.³ B65H *29/46*
U.S. Cl. 270—31 **10 Claims**



1. In a cloth spreading machine having a longitudinally movable frame and a driven cloth feed roll on the frame, a variable cloth feed speed control means comprising:

(a) an input pulley having a variable pitch,

(b) an output pulley having a variable pitch,

(c) belt means drivably engaging said input and output pulleys,

(d) input drive means operatively connected to said input pulley to rotate said input pulley at a rotary speed proportional to the linear speed of the movable cloth spreading machine frame,

(e) output drive means operatively connected to said output pulley and the cloth feed roll to rotate the cloth feed roll at a speed proportional to the rotary speed of said output pulley, and

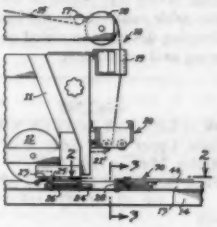
(f) control means for varying the pitches of said input and output pulleys in order to vary the relative speeds of the machine frame and the cloth feed roll.

4,462,584

CLAMP DEVICE FOR CLOTH SPREADING MACHINE SWITCH ACTUATOR

Hoyt L. Smith, and D. Frank Farrar, Jr., both of Nashville, Tenn., assignors to Cutters Exchange, Inc., Nashville, Tenn.

Filed Sep. 16, 1982, Ser. No. 418,847
Int. Cl.³ B65H *29/46*
U.S. Cl. 270—31 **8 Claims**



1. A clamp device for selective positioning upon the longitudinal track of a cutting table for cooperation with a control switch actuator on a cloth spreading machine movable over the cutting table and longitudinally of the track, comprising:

(a) a body member having a switch actuator element,

(b) said body member having an elongated jaw member adapted to engage one side of the track on a cutting table, in operative position,

(c) a cleat member,

(d) means mounting said cleat member on said body member opposing said jaw member for movement toward and away from said jaw member to engage the opposite side of the track from said jaw member in operative position and to disengage the track in an inoperative position, and

(e) actuator means on said body member operatively connected to said cleat member for moving said cleat member between operative and inoperative positions for selectively clamping and unclamping said body member on the track of a cutting table, so that, in operative position, said switch actuator element is fixedly positioned for cooperation with a corresponding control switch actuator of a cloth spreading machine supported for movement on the track of the cutting table.

4,462,585

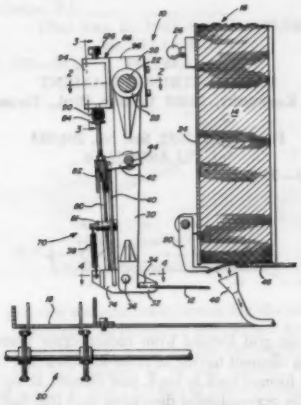
THICKNESS ADJUSTABLE MATERIAL DETECTOR FOR GRIPPER MECHANISM

Clarence L. Gieson, Proctor; Randy J. Marsh, and Reginald F. J. Lunt, both of Rutland, all of Vt., assignors to Metromail Corporation, Rutland, Vt.

Filed Apr. 6, 1982, Ser. No. 365,970
Int. Cl.³ B65H *5/10, 7/12*
U.S. Cl. 271—11 **11 Claims**

1. In combination with a mechanism for transferring a single sheet from a magazine to a conveyor during each operational cycle, said mechanism having an oscillatable shaft, a gripper lever fixed to the shaft, a movable jaw pivot means mounting the movable jaw on the lever in spaced relation to the shaft, actuating means connected to the movable jaw for opening and closing thereof to clamp sheets to the gripper lever and detecting means for interrupting operation of the transferring mechanism in response to withdrawal of none or more than one of the sheets from the magazine during any one of the operational cycles, the improvement including motion sensing means mounted on the lever in spaced relation to the pivot means and in engagement with the movable jaw for displacement relative to the lever in response to operation of the actuating means,

and means mounting the detecting means on the shaft in fixed relation to the lever for detecting said displacement of the



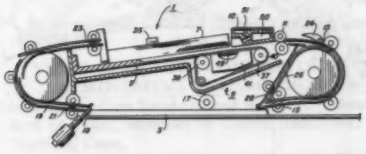
motion sensing means reflecting clamping of none or more than one of the sheets to the lever by the movable jaw.

4,462,586

SHEET FEEDING APPARATUS

John M. Browne, Ontario, and Morton Silverberg, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1981, Ser. No. 317,211
Int. Cl.³ B65H *3/04, 3/12*
U.S. Cl. 271—94 16 Claims



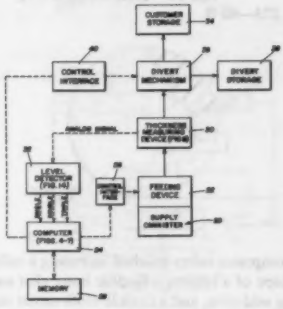
1. A sheet feeding apparatus for feeding sheets from a stack of sheets comprising a sheet stack supporting tray, a vacuum plenum and feed belt sheet separating and feeding assembly adjacent a sheet in a stack of sheets to be fed when a stack of sheets is in said supporting tray, said vacuum plenum and feed belt assembly comprising at least one feed belt having a vacuum plenum disposed within the run of the belt, the vacuum plenum and the belt assembly being positioned such that a rear portion lies opposite a portion of a stack of sheets to be fed and adjacent and parallel to the plane of the sheet to be fed and a front portion lies opposite the front portion of a stack of sheets to be fed and in a plane angled away from the plane of the sheet to be fed to provide a corrugation along a line perpendicular to the feeding direction in a sheet being fed.

4,462,587

METHOD OF AND SYSTEM FOR DETECTING BILL STATUS IN A PAPER MONEY DISPENSING

Harry T. Graef, Massillon, and Mark J. Wise, North Canton, both of Ohio, assignors to Diebold Incorporated, Canton, Ohio

Continuation-in-part of Ser. No. 305,847, Sep. 25, 1981, abandoned. This application Oct. 5, 1981, Ser. No. 309,022
Int. Cl.³ B65H *7/12*
U.S. Cl. 271—263 13 Claims



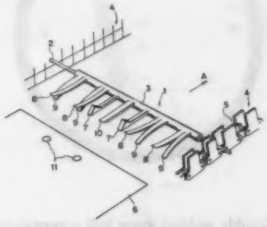
1. A method of detecting sheet status, such as overlapped sheets or folded sheets, on a sheet delivery conveyor, comprising the steps of measuring sheet thickness along the entire length of the sheet, and in response, generating a first signal when the measured sheet thickness corresponds to the thickness of at least one sheet and a second signal when the measured thickness corresponds to the thickness of at least two sheets; measuring sheet length and, in response, generating a third signal; arithmetically summing durations of said first and second signals related to corresponding sheet lengths and, in response, generating a fourth signal; and interpreting said third and fourth signals to determine sheet status.

4,462,588

APPARATUS FOR REGULATING THE CUTTING PLANE OF A STRIP

Mikio Kogane, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 30, 1982, Ser. No. 363,750
Claims priority, application Japan, Apr. 1, 1981, 56-47148[U]
Int. Cl.³ B65H *7/02*
U.S. Cl. 271—265 7 Claims



1. A strip conveying station, comprising; a pair of first conveying means, said first conveying means being respectively engageable with both ends of a guide clip engaging the leading edge of said strip, to convey said guide clip and said strip; and means for regulating a cutting plane of said strip comprising a pair of sensors provided at locations where said first conveying means are disengaged from said ends of said guide clip, holding means for applying pressure to said strip after said ends of said

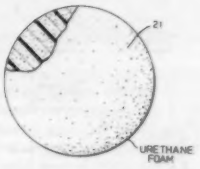
guide clip have been detected by said sensors, and second conveying means provided opposite to said holding means, for conveying said strip.

4,462,589

GAME BALL

Robert C. Morgan, BenLomond, Calif., assignor to Incrediball, Inc., Pleasant Hill, Calif.

Filed Apr. 7, 1982, Ser. No. 366,934
Int. Cl.³ A63B 37/06, 37/12
U.S. Cl. 273—60 R 11 Claims



1. A composite safety baseball including a cellular foam core in the shape of a sphere, a flexible inner skin surrounding and enclosing said core, and a flexible cloth cover surrounding and enclosing said inner skin, wherein the improvement in said safety baseball comprises:

said safety baseball being formed with a circumference in the range of 9.0 to 9.25 inches and with a weight in the range of 3.25 to 3.5 ounces; and

said cellular foam core being formed of a flexible resilient foam, and said composite safety baseball, including said core, said inner skin and said cover, having a hardness in the range of 25 to 45 on the Shore Type A hardness scale.

4,462,590

INFLATABLE PADDED GAME BALL

Mark E. Mitchell, Phelps County, Mo., assignor to Figgie International Inc., Richmond, Va.

Filed Oct. 22, 1982, Ser. No. 436,011
Int. Cl.³ A63B 41/08
U.S. Cl. 273—65 E 22 Claims

1. An inflatable padded game ball comprising:

an inner bladder assembly; and

an outer carcass enclosing the bladder assembly;

said carcass comprising an outer cover of relatively tough durable material, padding on the inside of the cover, and a liner on the inside of the padding;

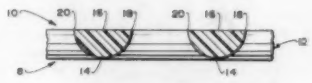
said inner bladder assembly comprising an inflatable bladder of a substantially air-impervious material, and a sheath around the bladder for restraining expansion of the bladder when it is inflated thereby to reduce the outward pressure on the carcass and thus increase the dimensional stability of the ball.

4,462,591

RACKET STRING FILAMENT

Charles A. Kenworthy, 18400 Ventura Blvd., Tarzana, Calif. 91356

Filed Jul. 1, 1982, Ser. No. 394,083
Int. Cl.³ A63B 51/06
U.S. Cl. 273—73 D 5 Claims



1. A strung grid formed from racket string filament, said racket string filament having in cross-section a first face and a second face formed back to back, said filament being strung in two generally perpendicular directions such that said first face only is exposed on one side of the racket, said second face only is exposed on the other side of said racket, forming a first uniform hitting surface on one side of said racket and a second uniform hitting surface on the other side of said racket,

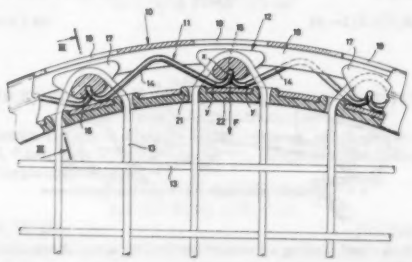
the cross-section of said first face being a convex shape, the cross-section of said second face being a flat or concave shape.

4,462,592

METALLIC FRAME FOR TENNIS RACKETS

Roberto Legger, Via Galluzia 1, Banchette (Torino); Lorenzo Amosso, Via Giuseppe Giacosa 49, Colleretto Giacosa (Torino), and Eligio Legger, Via Galluzia 1, Banchette (Torino), all of Italy

Filed Jul. 21, 1982, Ser. No. 400,239
Claims priority, application Italy, Jul. 22, 1981, 23076 A/81
Int. Cl.³ A63B 49/12
U.S. Cl. 273—73 D 6 Claims



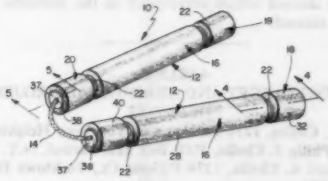
1. A metallic frame for tennis rackets of the kind comprising an elongate tubular section having therethrough an axial bore, an elongate, resiliently yieldable ring crown extending continuously intermediate its ends longitudinally through the bore in said tubular section, and resting at spaced points therealong against the bore wall of said tubular section, and a plurality of spaced racket string guiding and anchoring members mounted on said crown to be supported thereby resiliently in the bore of said tubular section, and said anchoring members having a string engaging portion, said string engaging portion being positioned within the bore of said tubular section.

4,462,593

MARTIAL ARTS PRACTICE WEAPON CONSTRUCTION

Edwin J. Carty, Jr., Cranston, R.I., assignor to Jukobudo, Inc., Providence, R.I.

Filed Aug. 23, 1982, Ser. No. 410,866
Int. Cl.³ F41B 15/02
U.S. Cl. 273—84 R **5 Claims**



1. A practice weapon construction for the martial arts and the like, comprising an elongated bar element having a padded casing located thereon, a padded cap element positioned adjacent to said bar element at an end thereof, resilient means received within at least a portion of said bar element at said end thereof and engaging said cap element in substantially axially aligned relation, so that said cap element is resiliently movable relative thereto upon impact of said cap element with an object, and stop means secured within said elongated bar element adjacent to an end thereof and receiving the innermost end of said resilient means, said stop means defining an inner stop for fixing the inner end of said resilient means in said bar element, a substantial portion of said resilient means extending beyond the outermost end of said bar element and being disposed in a permanent position thereat, wherein impact exerted in a longitudinal direction against the outermost end of said cap element by contact with an opponent of the user of the weapon results in a biased inward movement of said cap element in a longitudinal direction thereof relative to said bar element, the resilient means thereby effectively absorbing the longitudinal impact on said cap element without injury to said opponent.

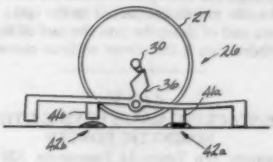
4,462,594

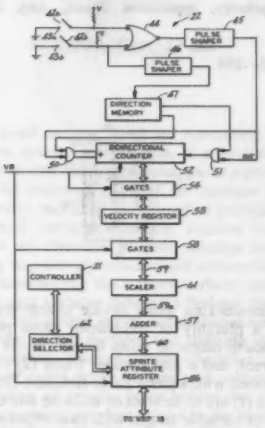
VIDEO GAME WITH CONTROL OF RATE OF MOVEMENT OF GAME OBJECTS

Eric Bromley, West Simsbury, and Robert A. Schenck, Hebron, both of Conn., assignors to Coleco, Industries, Inc., West Hartford, Conn.

Filed Sep. 29, 1982, Ser. No. 430,351
Int. Cl.³ A63F 9/22
U.S. Cl. 273—85 G **14 Claims**

9. In a video game comprising a video display, a video display memory having a plurality of addressable locations for storing indicia indicative of an object in a video display, said game providing a periodic pulse signal, means for periodically reading out objects from addresses in said video memory in a predetermined order to form successive video display frames, and a player controller coupled to said processor; said controller including player operable means for generating rate pulse at variable repetition rates, means for counting one of said rate pulses and said periodic pulses as a function of the other to establish a numerical value, said numerical value being indicative of a desired velocity of movement of an object to be displayed on said video display in succeeding display frames and means responsive to said numerical value to change the





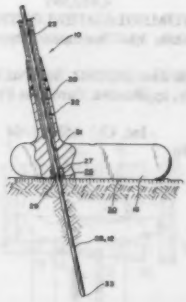
address of a picture element in said memory in accordance with the rate of the generated pulses.

4,462,595

ADJUSTABLY ALIGNABLE GOLF CLUB

Layne O. Hodson, 2744 E. Kayscreek Dr., Layton, Utah 84041

Filed Mar. 21, 1983, Ser. No. 477,170
Int. Cl.³ A63B 69/36
U.S. Cl. 273—164 **10 Claims**



1. A golf club having a head portion adapted to strike a golf ball, and a stem portion extending upwardly from the head portion and having a portion adapted to be gripped by the golfer, wherein:

the stem portion is tubular and continuously hollow from the head portion to and into the gripping portion of the club;

the head portion has an open ended bore therethrough axi-

ally aligned with the tubular stem portion; and said golf club further comprises

an elongate spike installed within the stem portion and the bore through the head portion, and the club further comprises handle means connected to the spike for inserting the lower end of the spike into the turf of the golf course and withdrawing it therefrom without moving the club.

4,462,596

PIECE-STACKING GAME DEVICE UTILIZING MAGNETIC FORCES

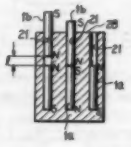
Shuzo Yamamoto, c/o Yasuyuki Yamamoto, 120 Ohaota, Kashiwashi, Chiba, Japan

Filed Jul. 21, 1982, Ser. No. 400,458

Claims priority, application Japan, Aug. 31, 1981, 56-128992[U]

Int. Cl.³ A63F *3/00, 9/14*

U.S. Cl. 273—239 **8 Claims**



1. A piece-stacking game device characterized in that it comprises: a plurality of rod-shaped game pieces (1) each having opposite magnetic poles formed at the opposite ends (11,12) thereof; and a piece holder frame (2) of nonmagnetic material formed with a piece guide structure along which said game pieces (1) are to be stacked endwise one on another in a single row of variable length with two adjacent game pieces (1) held in direct contact with or spaced apart from each other under magnetic attraction or repulsion acting between the opposed magnetic poles, respectively, of the two game pieces, said piece guide structure being so arranged that variation in length of said row of game pieces (1) is externally readily perceptible; and

said piece guide structure including at least one blind insertion hole (21) formed in said piece holder frame (2) and sized to slidably receive at least two of said game pieces (1).

4,462,597

COMBINED TOMBOLA AND LOTTERY CARD GAME

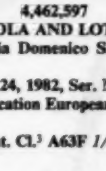
Antonia Caramazza, Via Domenico Silveri, 30, 00165 Rome, Italy

Filed Jun. 24, 1982, Ser. No. 391,652

Claims priority, application European Pat. Off., Jun. 8, 1982, 8283016.4

Int. Cl.³ A63F *1/04*

U.S. Cl. 273—296 **7 Claims**



1. A combined tombola and lottery card game comprising a player's deck of 90 cards and a dealer's deck of 90 cards, said cards in both decks being numbered sequentially on the fronts thereof with the numbers 1 to 90, all of said cards in each deck being provided on the fronts thereof with different graphical representations, said graphical representations of the two decks being similar and, in both decks, being associated with cards bearing the same number,

said cards in the player's deck being provided on the backs thereof with the same numbers which appear on the front thereof,

said cards in the dealer's deck having no numbers on the backs thereof which correspond to the numbers on the front thereof.

4,462,598

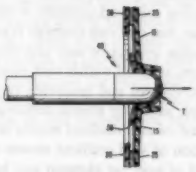
VANISHING TARGET AND ARROWHEAD PROJECTILE THEREFOR

Manuel L. Chalin, 1274 Pickens Ct., Yorktown Heights, N.Y. 10598; Philip J. Chalin, P.O. Box 122, Carmel, N.Y. 10592, and Stuart A. Chalin, 1274 Pickens Ct., Yorktown Heights, N.Y. 10598

Filed Dec. 14, 1981, Ser. No. 330,783

Int. Cl.³ F41J *3/00*; **F41B** *5/02*

U.S. Cl. 273—378 **20 Claims**



15. A target system, comprising:

(a) projectile means having a rounded impact head;

(b) a sheet of backing material penetrable by the projectile means;

(c) polyester film means at least partially covering the backing sheet, said polyester film means defining an exposed target surface and including a portion of predetermined shape defining a target zone, said portion being defined by an opening perforating the film means and means permitting separation of said portion from the remainder of said exposed target surface when struck by the projectile means, said portion being impenetrable by the projectile means, said projectile causing said portion to detach from the polyester film means and be pulled through the backing sheet to thereby vanish from the exposed target surface; and

(d) means for securing the film means on the backing sheet.

4,462,599

SOCCER PRACTICE DEVICE

Ralph Brown, c/o Melvin Clark, 4234 Interlake Ave. N., Seattle, Wash. 98103

Filed Sep. 30, 1983, Ser. No. 537,998

Int. Cl.³ A63B *69/00*

U.S. Cl. 273—411 **3 Claims**

1. A soccer practice device for use in practicing heading techniques comprising an elongated standard member formed of a plurality of elongated standard sections connectible end-to-end in aligned, nonrotative relationship, a portable base for receiving the lower portion of said standard member and for supporting said standard member in upright position, an elongated arm member cantilevered from the upper portion of said standard member so as to project generally horizontal when said standard member is in upright position, a soccer ball, a line having one end portion connected to said soccer ball, means carried by said members for guiding said line generally along the length of said arm member so as to suspend said soccer ball

from the outer free end portion of said arm member at a height appropriate for practicing heading said soccer ball, and means

carried by said standard member for attaching the free end portion of said line so as to maintain said soccer ball at such height and enabling adjustment of the height of the soccer ball.

4,462,600

ROTARY FLUID SEALS

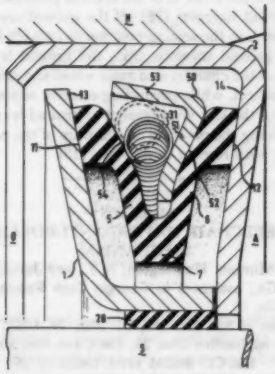
David E. Johnston, Newcastle upon Tyne, England, assignor to George Angus & Company Limited, Newcastle upon Tyne, England

Filed Jan. 12, 1984, Ser. No. 570,270

Claims priority, application United Kingdom, Jan. 19, 1983, 8301470

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—25 5 Claims



1. A rotary fluid seal, for preventing leakage of fluid between two coaxial relatively rotatable members, comprising a circular flexible sealing ring freely located to float substantially coaxially between axially opposed counterfaces of said relatively rotable members, said sealing ring having a pair of radially outwardly divergent, oppositely axially directed, sealing lips presenting annular contact faces to bear resiliently against said counterfaces respectively, said sealing lips having between them spring means acting radially so as indirectly to load said contact faces resiliently against said counterfaces, and rigid spring-retaining ring means which permits but limits centrifugal expansion of said spring means and retains said spring means in loading relationship to said sealing lips.

4,462,601

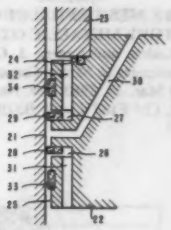
PISTON-CYLINDER SEALING DEVICE

Knut A. Skoog, Vrakvägen 7, S-274 00 Skurup, Sweden

Filed Feb. 21, 1980, Ser. No. 123,116

Int. Cl.³ F01B *29/10*

U.S. Cl. 277—27 6 Claims



1. An improved sealing device for preventing gas leakage between a first space containing gas at a cyclically varying pressure and a second space containing gas at a pressure corresponding to the minimum value of the pressure in said first space, said device including two elements provided with coaxial cylindrical surfaces effecting relative reciprocating movements in the direction of their common axis, the said surfaces being respectively concave and convex with the concave surface surrounding the convex surface, and the clearance between said surfaces defining a leakage flow path between the first and second spaces, a continuous sealing ring in a groove in one of said surfaces and slidingly engaging the other of said surfaces when in normal operation, said groove having a greater radial thickness than said continuous sealing ring for providing an annular space behind the ring, the improvement comprising gas duct means in the element having the groove with the sealing ring leading from said first space containing gas at cyclically varying pressure to the annular space behind said groove; and means for restricting the flow of gas in the portion of the leakage flow path between the first space and the sealing ring.

4,462,602

PISTON RING WITH ANNULAR EXPANDER SPRING

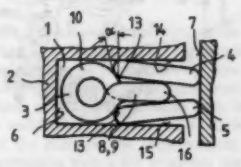
Bert Braüers, Blecher-Odenthal; Reiner Kierst, Bergisch-Gladbach, and Martin Morsbach, Burscheid, all of Fed. Rep. of Germany, assignors to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,627

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208396

Int. Cl.³ F01C *19/08;* F16J *9/06*

U.S. Cl. 277—139 11 Claims



1. A piston ring assembly comprising:

a ring-shaped expander spring composed of an annular body defining an axial direction and presenting a circumferential main bending region and a plurality of resilient tongues extending radially outwardly from said main bending region and adjoined, adjacent said main bending region, by generally axially extending parts of said annular body and

a lamina lying, at least in part, on said tongues and being radially supported by the axially extending parts, said main bending region being disposed radially inwardly of said lamina.

4,462,603

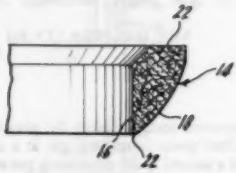
KNITTED WIRE MESH EXHAUST COUPLING SEAL WITH REFRACTORY METALLIC OXIDE IMPREGNANT

Peter P. Usher, Union, and Eugene J. Gavaletz, Toms River, both of N.J., assignors to Metex Corporation, Edison, N.J.

Filed Mar. 16, 1983, Ser. No. 476,553

Int. Cl.³ F16J *15/12*; B32B *31/06*

U.S. Cl. 277—230 **4 Claims**



1. An impregnated seal, comprising knitted wire mesh compressed to the size and shape of the seal with the wire of the knitted wire mesh firmly interlocked to provide the seal with sufficient density and structural rigidity to withstand force applied to the seal in use and having voids between the wires and a refractory metallic oxide impregnated in the knitted wire mesh to fill the voids between the wires and coat the surface of the wires.

4,462,604

SIZE-ADJUSTABLE ERECTING WHEELCHAIR

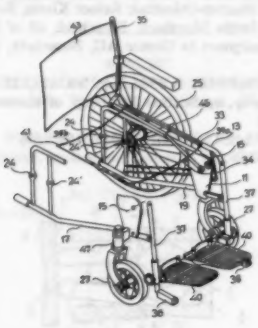
Bruno Meyer, Wohlen, Switzerland, assignor to Valutec AG, Dottikon, Switzerland

Filed May 13, 1982, Ser. No. 377,603

Claims priority, application Switzerland, May 18, 1981, 3222/81

Int. Cl.³ A61G *5/02*

U.S. Cl. 280—242 WC **6 Claims**



1. A size adjustable erecting wheelchair, particularly a collapsible wheelchair, comprising

a main frame (**11**);

two main wheels (**25**);

at least one caster wheel (**27**);

at least one caster wheel support means (**47**) supporting the caster wheel from the frame;

a seat-erecting frame (**13**);

means for defining a pivot axis (**15**) on said main frame;

means (**24**) for securing the main wheels to the frame,

having at least two spaced bearing positions (**24, 24'**) located at different distances from said axis (**15**) for selective positioning of the main wheels closer to, or farther away from, said axis;

said seat-erecting frame including a seat (**33**) having a forward edge (**34*a***) located by a predetermined distance from said axis, and a back edge (**34*b***), a back rest (**35**) located close to the top surface of the seat at a predetermined distance from said front edge,

foot rest support struts (**37**) and ground supports (**38**) secured to the struts,

said struts connecting the ground support

to the seat such that, in the seating position, the ground supports are spaced from ground level (G) while in the erected position, the ground supports (**38**) are resting on the ground (G), the seat-erecting frame pivoting with respect to said pivot axis (**15**);

and a parallelogram linkage (**45**; **45*a***, **45*b***, **45*c***) connecting the backrest (**35**), the seat, and said footrest support struts to the main frame (**11**) and pivotable about said pivot axis, to keep the backrest upright in each position of the seat of the chair with respect to the main frame (**11**) and to position the ground supports (**38**) on ground (G) upon erection of the chair,

wherein

the parallelogram linkage (**45**, **45*a***, **45*b***, **45*c***) comprises link means of varying lengths for selective positioning of the backrest (**35**) closer to, or farther away from, said axis (**15**) to permit relative adjustment of the length of the seat;

said at least one caster wheel support means (**47**) being of variable length to permit adjustment of the height of the front edge (**34*a***) of the seat with respect to ground level (G); and

wherein the struts (**37**) are adjustable in length and matched to the length of the caster wheel support means (**47**), for placement of the ground support (**38**) on the ground level (G) when the chair is in the erected position, and to raise the ground supports (**38**) off the ground level (G) when the chair is in the seating position to provide for clearance of the ground supports from the ground level and free rolling of the chair by said main wheel and said at least one caster wheel, while permitting relative adjustment of the height of the seat with respect to ground level, and while maintaining the pivoting relationship of the parallelogram linkage with respect to said axis (**15**).

4,462,605

WHEELCHAIR HAVING ANTI-ROLLBACK MECHANISM

Kenneth S. Morgan, Huntington, N.Y., and James W. Brazell, Atlanta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

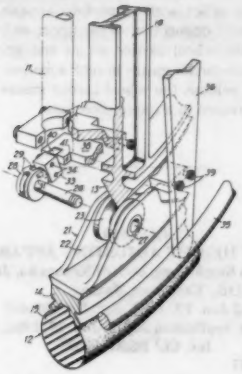
Continuation of Ser. No. 268,831, May 29, 1981, abandoned. This application Jun. 28, 1983, Ser. No. 508,603

Int. Cl.³ B62M *1/14*; B60B *19/00*

U.S. Cl. 280—242 WC **14 Claims**

1. In a wheelchair having manual propulsion wheels, an anti-rollback mechanism for each manual propulsion wheel comprising a frame attached to such wheel, a follower roller on said frame having a one-way freewheeling and one-way engaging clutch, a support shaft for the follower roller journaled on said frame and being driven in rotation by the clutch when the clutch is engaged, a rotation blocking element secured to said shaft, a biased stop element on the propulsion wheel positioned to stop rotation of said blocking element and shaft in the direction to cause backward rolling of said chair, disengage means interconnecting the biased stop element and manual propulsion wheel whereby manual pressure on the wheel to cause intentional backward rolling of the wheelchair

releases the biased stop element from said blocking element, and a relatively stationary raceway on the wheelchair for said



follower roller around which the roller and manual propulsion wheel may orbit.

4,462,606

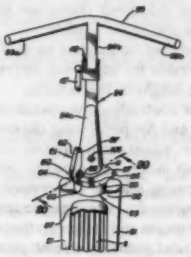
FOLDABLE AND PORTABLE VEHICLE

David T. Hon, Los Angeles, Calif., assignor to Hon Corporation International, Los Angeles, Calif.

Division of Ser. No. 233,624, Feb. 12, 1981, Pat. No. 4,433,852. This application Sep. 29, 1982, Ser. No. 427,555

Int. Cl.³ B62K *21/24*

U.S. Cl. 280—278 5 Claims



1. In a foldable and portable bicycle, the combination of:

first and second members that normally are disposed in side-by-side relation in a normal operating position and are swingable apart about a hinge between said members defining a hinge axis along one side;

and a latch for holding said members releasably in said normal operating position, comprising an actuator arm, a first pivot spaced from and parallel to said hinge axis between one end of said actuator arm and said first member, a second arm lying alongside said actuator arm, a second pivot parallel to said hinge axis overlying said first pivot and connecting one end of said second arm to said second member, and a pivotal connection between the free ends of said arms, said pivotal connection being movable in one direction relative to said pivots into an over-center latched position, and in the opposite direction relative to said pivots to an unlatched position.

4,462,607

RECLINING MECHANISM FOR BABY CARRIAGE

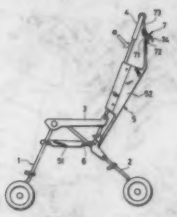
Shinroku Nakao, Kanagawa, and Kouichi Kobayashi, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,719

Claims priority, application Japan, Oct. 6, 1980, 55-142430[U]

Int. Cl.³ B62B *7/06*

U.S. Cl. 280—644 1 Claim



1. A baby carriage comprising a pair of side frames coupled at their upper ends by a hand rod, a seating sheet coupled on either side to said side frames, said seating sheet including a seat portion on which a baby sits and a back position on which a baby reclines, said back portion including a lower part and an upper part with the lower part of said back portion being coupled on either side to said side frames, and slidable connection means coupling the upper part of said back portion to said hand rod; said slidable connection means comprising a stationary loop having an aperture therein suspended from said hand rod, a slidable loop larger than said aperture adjustably secured to said upper part of said back portion, said upper part of said back portion extending in a first direction through said aperture in said stationary loop, around a portion of said slidable loop and back through said stationary loop aperture in an opposite direction and a separate lever operatively associated with said slidable loop for moving said portion of said slidable loop away from said stationary loop to thereby permit an adjustment of the position of the upper part relative to said slidable loop whereby the reclining angle of said back portion may be adjusted, said stationary loop, said slidable loop and said lever each having overlaying portions with aligned apertures for loosely receiving a common shaft, wherein said separate lever and said slidable loop are loosely secured together to said stationary loop.

4,462,608

STEERABLE SUSPENSION BEARING ASSEMBLY

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 1, 1983, Ser. No. 528,569

Int. Cl.³ B60G *11/42*

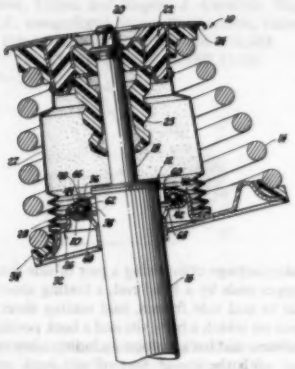
U.S. Cl. 280—668 3 Claims

1. In a steerable vehicle suspension strut of the type in which a shock absorbing compression spring surrounds a piston type damper and has one spring end relatively non-turnable with respect to the vehicle, while the other spring end biases a lower spring seat which is relatively turnable with respect to said damper on the anti-friction elements of a bearing seated on a bearing seat of the damper, the improvement comprising a shielding and retention means for retaining the lower spring seat and bearing together as a subassembly of the suspension strut when separate from the strut, as well as for shielding the bearing when the subassembly is assembled with the strut and comprising,

a generally cylindrical first shielding wall portion spaced sufficiently from the damper to provide clearance therefrom as the subassembly is assembled with the strut and extending a sufficient axial distance alongside the bearing to shield the bearing from contaminants thereat,

a generally annular second shielding wall portion extending from the first shielding wall portion over a portion of the lower spring seat and spaced a predetermined axial clearance therefrom,

and a retention portion on the first shielding wall joined non-rotatably to a portion of the bearing and cooperating with said first shielding wall portion to hold said bearing and said lower spring seat portion together as a separate subassembly until assembled with the suspension strut,



the axial biasing of the lower spring seat toward the seated bearing by the spring when the subassembly is assembled with the suspension strut serving to maintain not less than the said axial clearance between the upper surface of the lower spring seat and the second shielding wall to assure free turning of the damper relative to the lower spring seat on the bearing, the first and second shielding walls acting to exclude contaminants from the bearing during its operation.

4,462,609

INDEPENDENT WHEEL SUSPENSION FOR MOTOR VEHICLES

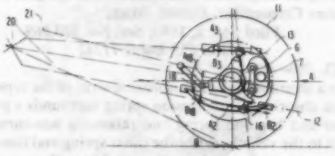
Manfred von der Ohe, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,991

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048755

Int. Cl.³ B60G *3/00*

U.S. Cl. 280—690 **21 Claims**



1. An independent wheel suspension for a motor vehicle, the wheel suspension including a wheel carrier means for carrying each suspended wheel, means for supporting each wheel carrier means at a body portion of the vehicle in a manner allowing pivoting of the wheel carrier means in response to the influence of a longitudinal force, said means for supporting including upper and lower wishbone means connected to each wheel carrier means, said pivoting occurring about an instantaneous center of rotation as viewed from the side, track rod means extending generally transversely of the vehicle and connected to the respective carrier means and the body portion of the vehicle for guiding a movement of the carrier means, and means for elastically connecting at least a portion of the supporting means to the body portion of the vehicle, said track rod means being offset with respect to an axis of rotation defined by points of connection of the upper and lower wishbone means at the wheel carrier means and being arranged with respect to the carrier means in such a manner that, during a braking of the vehicle, the wheel carrier means and respective wheel are pivoted in a toe-in direction.

4,462,610

VEHICLE HEIGHT ADJUSTING APPARATUS

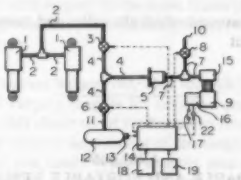
Tetsuo Saito, and Sumio Ema, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Jun. 17, 1982, Ser. No. 389,462

Claims priority, application Japan, Jun. 19, 1981, 56-90695[U]

Int. Cl.³ B60G *17/00*

U.S. Cl. 280—707 **2 Claims**



1. An apparatus for adjusting the height of a vehicle, said apparatus comprising:

height adjustor means, adapted to be connected between sprung and unsprung masses of the vehicle, for receiving therein pressurized air to increase the height of the vehicle and for having exhausted therefrom pressurized air to decrease the height of the vehicle;

air compressor means connected to said height adjustor means and operable for supplying thereto pressurized air to increase the height of the vehicle;

control means for controlling the operation of said air compressor means and for preventing the overheating of said air compressor means, said control means comprising actuating circuit means connected to said air compressor means for operating said air compressor means, temperature detector means for detecting the temperature of said air compressor means and for generating a signal representative thereof, and memory circuit means connected to said actuating circuit means and to said temperature detector means for receiving said signal from said temperature detector means, for, upon the temperature detected by said temperature detector means exceeding a predetermined level, deactivating said actuating circuit means and thereby stopping operation of said air compressor means, and for, upon the temperature detected by said temperature detector means dropping below said predetermined level, preventing automatic reactivation of said actuating circuit means and restarting of operation of said air compressor means; and

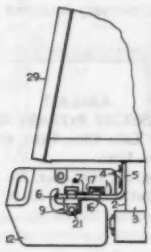
means for selectively setting said memory circuit means in a normal condition thereof to reactivate said actuating circuit means to restart operation of said air compressor means upon said detected temperature being below said predetermined level, said setting means comprising a vehicle main switch connected to said memory circuit means and selectively manually operable to set said memory circuit means in said normal condition.

4,462,611

FRONT END TRACTOR WEIGHT ASSEMBLY

Gerald E. Sieren, Greendale, Wis., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Oct. 7, 1981, Ser. No. 309,236
Int. Cl.³ B60R 11/00; B62D 37/04
U.S. Cl. 280—759 7 Claims



1. A front end weight carrier assembly for a tractor comprising, a carrier bar supporting structure extending the width of the tractor, a carrier bar mounted on said supporting structure extending at least the width of the tractor and defining a horizontal weight supporting surface for slidably assembling weights from the front or sides of said tractor, a grille in spaced relation above said carrier bar, at least one weight having a horizontal slot extending into the weight for receiving said carrier bar and positioning said weight under said grille, said slot partially defined by a weight carrying surface forming a weight supporting interface with said weight supporting surface of said carrier bar, said weight including a handle on the forward end for convenience in assembly and disassembly on said carrier bar, fastening means for fastening weights to said carrier bar in fore and aft parallel position under the grille of said tractor including means defining a recessed portion extending above said slot, a cross bar extending through the recessed portion of said slot, means fastening said cross bar to said carrier bar, bracket means on each side of the weights on said carrier bar compressively biasing said weights together.

4,462,612

TRAILER TELESCOPIC SUPPORTING LEG WITH DETACHABLE FOOT

Hans Dreyer, Egelsbach-Bayerseich, and Gerald Müller, Rodgau, both of Fed. Rep. of Germany, assignors to Jost-Werke GmbH, Neu Isenburg, Fed. Rep. of Germany

Filed May 12, 1982, Ser. No. 377,379
Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119359
Int. Cl.³ B60S 9/02
U.S. Cl. 280—766.1 1 Claim

1. In a supporting device of a telescopic type having an extensible leg:

a tubular sleeve fitted in the lower end of the leg, a ground plate fastened to the lower end of the sleeve, said plate jutting out sideways from the leg to define an edge section,

a holding ring lying over the edge section,

a supporting plate secured to the lower edge of the holding ring,

an elastic compression body between the ground plate and the supporting plate,

bolt means loosely securing the tubular sleeve to the leg, said bolt means passing through diametral holes in the sleeve, threaded nut means on the inner side of the sleeve receiving the bolt means, diametral holes in the supporting leg being larger than the diameter of the holes in the sleeve so that the bolt means may be received within the wall of the leg and the leg may be fully withdrawn into a telescopic guiding tube.

4,462,613

SLIDER FOR AUTOMATIC SEAT BELT ARRANGEMENT

Yuji Nishimura, Nagoya, and Hideki Tanaka, Toyota, both of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 26, 1982, Ser. No. 362,130
Claims priority, application Japan, Mar. 28, 1981, 56-43866
Int. Cl.³ B60R 21/10
U.S. Cl. 280—804 24 Claims

1. A slider for use in an automatic seat belt arrangement of a motor vehicle and the like, which is arranged to be connected to a webbing of the seat belt arrangement through a coupling member so as to be slidably moved within a guide rail for said seat belt arrangement, and displaced between one position for releasing the webbing and the other position for fastening said webbing according to selective opening and closing of a door of the motor vehicle, said slider comprising:

a slider main body,

a slider upper head portion, provided at one end of the slider main body,

a driving tape mounting portion, provided at an intermediate portion of the slider main body,

a leg portion, provided at the other end of the slider main body, for connecting thereto the coupling member for the webbing,

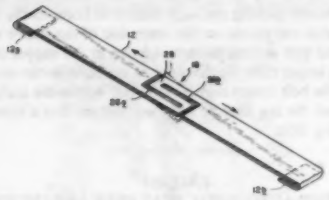
at least a pair of pins, fixedly provided on the slider upper head portion,

an enlarged slider head portion, further provided on the slider upper head portion,

wherein said pins are secured to said slider upper head portion by forcing said pins into corresponding openings formed in said slider upper head portion,

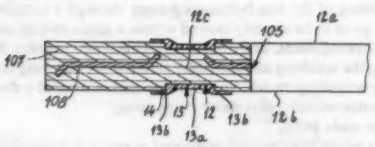
wherein said corresponding openings are notches laterally formed in opposite side edges of said slider upper head portion.

4,462,614
PAGE MARKER
Edward Krause, 90 Upton St., Quincy, Mass. 02169
Filed May 3, 1982, Ser. No. 373,966
Int. Cl.³ B42D 9/00
U.S. Cl. 281—42 11 Claims



1. A book marker comprising
A. a pair of relatively rigid elongated member end sections;
B. means defining a pair of hooks or clips at the remote ends of the end sections; and
C. elastic means
(1) composed of a plurality of narrow resilient connections formed integrally with said end sections from a single blank of material; and
(2) extending between said end sections permitting said sections to be extended resiliently so that the clip or hook-defining means can engage and clamp the opposite edges of a book page.

4,462,615
CYLINDER HEAD GASKET
Georges Ulmer, Lyons, and Bernard C. D. Genin, Venissieux, both of France, assignors to Societe Anoayme Dite: Curty, Saint-Priest, France
Filed May 4, 1983, Ser. No. 491,568
Claims priority, application France, May 27, 1982, 82 09698
Int. Cl.³ F16J 15/06
U.S. Cl. 277—235 B 12 Claims

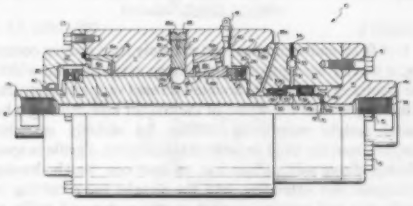


1. A cylinder head gasket for an internal combustion engine, comprising a compressible fluid sealing body formed with orifices alignable with cylinders of a cylinder block, holes to be traversed by bolts for clamping the gasket between a cylinder head and the cylinder block, and passages for fluid circulating through the cylinder block, said body being provided around said passages on each face thereof with respective outwardly open grooves, each groove being located opposite a corresponding groove of the other face across the body, and respective sealing strips received in said groves, each of said sealing strips comprising a web disposed in the respective groove and of a thickness at most equal to the depth of the groove, and a lateral flange unitary with said web overlying the respective face of the body adjacent the respective groove.

4,462,616
RECORD MATERIAL
Kenneth J. Shanton, Beaconsfield, England, assignor to The Wiggins Teape Group Limited, Hampshire, England
Filed Nov. 18, 1982, Ser. No. 442,566
Claims priority, application United Kingdom, Dec. 4, 1981, 8136583
Int. Cl.³ B41M 5/16, 5/18, 5/22
U.S. Cl. 346—210 2 Claims

1. Record material carrying hydrated zirconia as a colour developer.

4,462,617
HIGH PRESSURE ROTARY COUPLING
Sidney J. Green, Salt Lake City, Utah, assignor to Terra Tek, Inc., Salt Lake City, Utah
Filed Aug. 31, 1981, Ser. No. 297,738
Int. Cl.³ F16L 55/00
U.S. Cl. 285—14 7 Claims



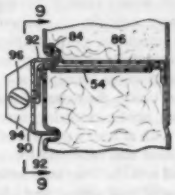
1. A high pressure rotary coupling comprising, a stationary body portion arranged for connection to a stationary source of fluid under pressure and to accommodate a rotating body portion journaled thereto; a rotating body portion arranged for connection to a turning rotor and for journaling to said stationary body portion; bearing means for journaling said rotating body portion to said stationary body portion; means for maintaining said rotating body portion journaled to said stationary body during transfer of fluid under pressure therethrough, and as components of said stationary body portion, a stuffing box section and means for releasable coupling it to said stationary body portion as an end, and a stuffing box end cap that includes means for releasable connecting it to said stuffing box section end opposite to its coupling to said stationary body portion, and means for coupling it to said stationary source of fluid under pressure, the stuffing box section internally stepped to leave an open longitudinal section extending axially into said stuffing box section from the end cap end, which longitudinal section is walled by an axially extending end of said rotating body portion journaled within said stationary body portion, and is closed by said stuffing box end cap to form a packing seal cavity; primary and secondary packing seals for individually fitting in said packing seal cavity between said stuffing box section and axially extending end of said rotating body portion for sealing against a fluid flow therebetween; means for maintaining said primary and secondary packing seals in spaced apart relationship; and wherein said means for maintaining said rotating body portion journaled to said stationary body includes groove means formed in each said stationary and rotating body portion that, with said rotating body portion telescoped within said stationary body portion, align to form a continuous track to receive individual hardened balls installed therein; hardened balls for installation in said aligned grooves; port means wherethrough said hardened balls are passed into said aligned grooves from without the coupling, and closure means for closing off said port means, which closure means includes an arrangement for closing said stationary body portion groove.

4,462,618

PREFABRICATED DOUBLE-WALLED METAL CHIMNEY

Richard L. Stone, Los Altos, Calif., assignor to Wallace Murray Corporation, Belmont, Calif.

Filed Mar. 16, 1981, Ser. No. 244,033
Int. Cl.³ F16L *59/14*
U.S. Cl. 285—47 **17 Claims**



1. A prefabricated double-walled chimney section adapted to be connected to a similar section to form a chimney column, said section comprising:

a cylindrical inner imperforate wall member;

a cylindrical outer wall member having a greater diameter than and spaced radially outwardly from said inner wall member, thereby forming an annular cavity for a quantity of compressible fibrous insulation material between said inner and outer wall members;

male coupling means at one end of said section including a plurality of relatively narrow and rigid structural members attached to and extending between end portions of said inner and outer wall members;

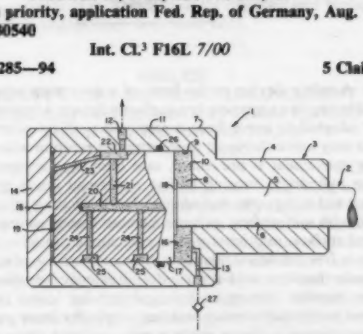
female coupling means at the other end of said section including spaced apart end portions of said wall members for receiving said male coupling means, a flexible and partially movable annular retainer member of relatively low heat conducting material extending between said spaced apart end portions for holding said insulation in place between said inner and outer wall members, and means in said outer wall member for holding said retainer member against the end of the insulation material between said wall members.

4,462,619

MECHANICAL SEALING MEANS FOR ROTARY FLUID COUPLING

Karl Hötger, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,414
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030540
Int. Cl.³ F16L *7/00*
U.S. Cl. 285—94 **5 Claims**



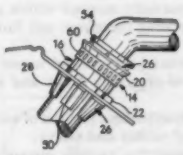
1. A fluid coupling including a shaft element and a hub element having fluid conveying ducts therein, said coupling including means for interconnecting the fluid-conveying duct in said shaft element to the duct in said hub element, at least one of said elements being rotatable relative to the other, said fluid coupling comprising a bore in said hub element which receives said shaft element, said hub element and said shaft element having seal means therebetween with cooperating large diameter portions of the elements communicating with smaller-diameter portions, means forming separate chambers at opposite sides of the large diameter portion of said shaft element, an axial passageway extending through the shaft element and adapted to be connected at one end to a source of fluid under high pressure, a radial passageway connecting high-pressure fluid in said axial passageway to a groove in the periphery of said large diameter shaft portion, said seal means being situated along said large diameter portions between said groove and the chamber at said smaller-diameter portions, an output port in said hub element adapted to communicate with said groove, means for subjecting the chamber at the end of said large diameter shaft portion opposite its reduced-diameter portion to high-pressure fluid in said axial passageway, and means for subjecting the chamber at the other end of said large diameter shaft portion to a sealing fluid at a pressure at least equal to the pressure of said high-pressure fluid to prevent flow of the latter fluid past said sealing means.

4,462,620

MOTOR VEHICLE FILL PIPE TO FUEL TANK CONNECTOR

Charles L. Bambenek, Farmington Hills, and Craig W. Lewitzke, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 10, 1981, Ser. No. 282,119
Int. Cl.³ F16L *5/00, 25/00*
U.S. Cl. 285—162 **6 Claims**



1. A combination seal and attachment for connecting a fuel fill pipe to a motor vehicle type fuel tank comprising, a tubular grommet of resilient deformable material having one end insertable into an opening in the fuel tank and receiving a fuel fill pipe therein of comparable diameter for connecting and sealing the pipe to the tank;

a flexible finger-like member of less resiliency than the grommet embedded in the grommet between the inner and outer radial surfaces thereof providing rigidity to the grommet, the finger-like member extending coaxially of the grommet;

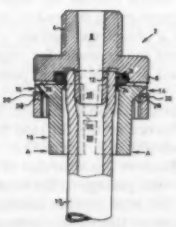
the grommet having an annular groove in its outer surface adapted to receive therein the edge of a fuel tank wall defining an opening, the finger-like member having a nose portion with a chamfered surface at one end extending radially beyond the grommet for engagement by the edge of the fuel tank wall upon axial passage of the grommet through the opening, passage of the nose portion of the finger-like element through the wall opening in one direction in the absence of the fill pipe being received in the grommet camming the finger-like member radially inwardly to a diameter less than that of the fill pipe and wall opening to permit passage of the nose portion axially past the opening, the nose portion having a one-way locking surface contiguous thereto and engageable with the tank wall edge resisting return movement of the ramp surface in the opposite direction subsequent to passage of the nose portion in the one direction through the opening, the axial

sliding insertion of the fill pipe through the grommet engaging the lower edge of the fill pipe with the inwardly located finger-like member forcing the same radially outwardly to engage the locking surface with the tank wall edge, and clamp means to clamp the grommet to the fill pipe to resist relative movement therebetween.

4,462,621
SWIVEL STOP
Earle F. Chapman, Barnard, Vt., assignor to Chapman Mfg. Co. Inc., Avon, Mass., a part interest
Filed May 29, 1981, Ser. No. 268,257
Int. Cl.³ F16L *27/00*
U.S. Cl. 285—282 **12 Claims**

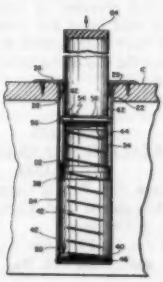
1. A swivel stop comprising:
(a) a lower tube and an upper tube;
(b) a member partially secured within said lower tube and partially extending therefrom and formed with a keyway and a stop;
(c) a sleeve secured within said upper tube and provided with a pair of angularly offset and axially spaced apart keys;
(d) said partially extending portion of said member, designed to fit into and within said sleeve;
(e) said keys projecting radially inwardly from said sleeve;
(f) said keys designed to be axially displaceable within said keyway; and
(g) said tubes being rotatable relative to one another until one of said keys strikes said stop.

4,462,622
PIPE CONNECTOR
Yzhak Barzuza, Petak Tikva, Israel, assignor to Filtration Water Filters for Agriculture & Industry Ltd., Tel Aviv, Israel
Filed May 17, 1982, Ser. No. 379,201
Claims priority, application Israel, May 24, 1981, 62945
Int. Cl.³ F16L *21/06, 39/00, 17/00*
U.S. Cl. 285—323 **7 Claims**



1. A quick-action push-in connector for fluid-carrying tubing, said connector comprising: an outer member having fluid passage means, a substantially tubular inner member at least partially, axially accommodated to said outer member, said inner member having a substantially central passage adapted to admit said tubing to effect communication of said tubing with said fluid passage means, said inner member being provided with at least one inwardly directed gripping protrusion to engage said tubing, said tubular member being constituted by at least two longitudinal portions, means for articulating said longitudinal portions to one another having an axis of articulation substantially perpendicular to and intersecting the axis of said tubular inner member, said gripping protrusion being borne by said longitudinal portion proximate to said fluid passage means of said outer member, and wherein at least at said protrusion the inside diameter of said inner member is reducible against an elastic restoring force by interaction of said inner member with at least a portion of said outer member, and expandable against said restoring force by application of a spreading force, and is in the free, unreduced state smaller than the outside diameter of said tubing, and adapted to undergo an initial expansion when said tubing is pushed in, and wherein an attempt to pull out said tubing once pushed in, initiates said interaction, whereby said protrusion exerts a gripping effort on said tubing, preventing the withdrawal thereof, and wherein said longitudinal portion of said tubular inner member remote from said fluid passage means of said outer member extends beyond said outer member for permitting a compressive force to be applied thereto, resulting in a reactive expansion of said longitudinal portion of said tubular inner member bearing said gripping protrusion to release said tubing and permit withdrawal thereof.

4,462,623
SAFETY DOOR STOPPER
Craig A. Grant, 36 Elaine Ave., Portsmouth, R.I. 02871
Filed Sep. 29, 1982, Ser. No. 426,397
Int. Cl.³ E05C *1/10*
U.S. Cl. 292—175 **5 Claims**



1. A safety device in the form of a door stop adapted for positioning in an opening in a surface adjacent a movable door and adapted to move from a retracted position wherein said door may move therepast to an extended position wherein said door movement is prevented, said door stop comprising an outer cylindrical housing having upper and lower ends, said upper end being open and adapted for positioning substantially flush with said surface, an inner member having an outer cylindrical surface, said inner member positioned to telescopically slide in free rotational relation to the inner surface of said outer cylinder between said retracted and extended positions, said inner member having an enlarged annular lower end positioned to slidably contact said outer cylinder inner surface so as to function as lower guide means, and said outer cylinder open upper end including means for slidably contacting said inner member and acting as upper guide means, spring means for continually urging said member upwardly to its extended position wherein it projects above said outer cylinder upper

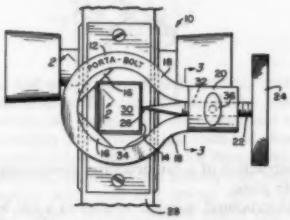
end so as to contact and block said movement of said door, positioning means inwardly extending from said outer cylinder at an intermediate location between the ends thereof, said inner member including outwardly biased detent means adapted to extend from the outer surface thereof at an intermediate point thereof and engage undersurface portions of said positioning means such that said member is retained in said retracted position, said member downwardly movable against the action of said spring means by pressure applied to the top thereof such that sudden release thereof enables said detent means to move past said positioning means to its extended position wherein said enlarged lower end of said member positively contacts said positioning means so as to prevent further upward movement of said member by said spring.

4,462,624

LATCH DEAD-BOLTING MEANS

Rocco Zanzonico, P.O. Box 398, Denville, N.J. 07834

Filed May 17, 1983, Ser. No. 495,241
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—258 6 Claims



1. Means for dead-bolting a standard latch, comprising:
a frame having inner and outer, opposite surfaces;
said inner surface having means thereon defining at least one blade;
said frame further having a threaded channel formed therein; and
rod means threadedly engaged with said channel for threaded advance and withdrawal thereof along said channel; wherein
said rod means has a leading end and a trailing end;
said leading end has means for engaging a latch and arresting the same against movement; and
said trailing end has means defining a handle which is manipulatable for threadedly advancing said rod means along said channel, for forcing said leading end into arresting engagement with a latch, and for drawing said blade into incisive engagement with such latch.

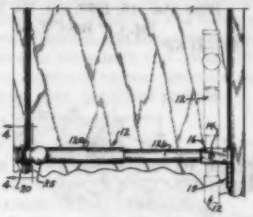
4,462,625

SAFETY ENTRY LATCHING ARRANGEMENT

Alton L. Barnhill, 165 Highland Clr., Paducah, Ky. 42001

Filed Feb. 8, 1982, Ser. No. 346,940
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—259 R 3 Claims

1. A safety entry latching arrangement comprising a frame surrounding an entry, a hinge pin assembly supported on said frame, a pivotal two section securing member having an end hingedly secured to said hinge pin assembly, one section being longitudinally movable with respect to the other, mounting means serving selective pivotal movement of said securing member in an upwardly and downwardly direction, said mounting means hingedly connecting said hinge pin assembly and pivotally receiving one section of said pivotal securing member, means connecting said hinge pin assembly urging said pivotal securing member into a preselected position, a latch disposed on said frame at a side thereof opposite to said hinge pin assembly, said latch including a portion in a selective corresponding latching relationship with the other section of said pivotal securing member, and slidable plates disposed within the two sections of said pivotal securing member, each of said



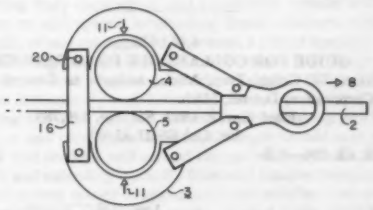
slidable plates including a slotted portion receiving an assembly pin.

4,462,626

CONVEYOR BELT REPAIR TOOL

Klaus Heidemann, 133 Kenney Dr., Sewickley, Pa. 15143

Filed Jun. 1, 1983, Ser. No. 500,281
Int. Cl.³ A44B *21/00*
U.S. Cl. 294—114 1 Claim



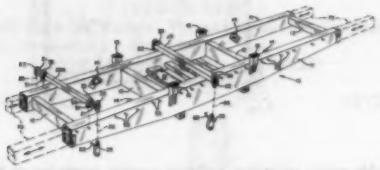
1. A conveyor belt tool for seizing a conveyor belt which comprises:
(a) a pair of bars of length greater than the width of said conveyor belt;
(b) a pair of clamps, slidable along said bars, adapted to compress said bars together thereby exerting a seizing force on said conveyor belt which is disposed between said bars, said clamps exerting said force on said bars at two locations along the length of said bars, the distance between said location being adjustable to approximately equal the width of said conveyor belt due to the slidable feature of said clamps,
(c) wherein said bars are approximately circular in cross section, at least one bar being circular except at at least two flattened circumfrential locations, said locations having different radial lengths to provide flat gripping surfaces each of which grips said belt with plane-on-plane contact, the force applied on said belt being selectable according to the belt thickness by selection of a specific flattened section of said bar and means on the clamps for rotationally mounting said at least one bar to the clamp for moving said selected surface into juxtaposition with said belt, said mounting means including at least one semicircular inner surface which conforms with the semicircular outer surface of said at least one bar.

4,462,627

LIFT FRAME ASSEMBLY

Mark L. Kudlicka, Lake Oswego, Oreg., assignor to Cranston Machinery Co., Inc., Oak Grove, Oreg.

Filed Mar. 15, 1982, Ser. No. 357,984
Int. Cl.³ B66C *1/66*
U.S. Cl. 294—81 SF **11 Claims**



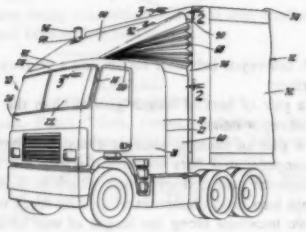
1. A lift frame comprising a pair of parallel horizontal longitudinal beams interconnected by cross members, a plurality of transverse spreader bars mounted for movement to different positions along said beams, spreader bar extensions slidable outward from the ends of said spreader bars, load supporting means on the outer ends of said extensions, and a dual function latch pin in each end of each of said spreader bars, each latch pin securing the adjacent spreader bar extension in extended and retracted positions and securing the adjacent end of its spreader bar in different selected positions along the adjacent beams, said latch pin having a short range of sliding movement to release its spreader bar extension for extension or retraction and having a longer range of sliding movement to release said adjacent end of the spreader bar for said movement along said adjacent beam.

4,462,628

GUIDE FOR COLLAPSIBLE DRAG REDUCER

Willard W. Gregg, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1982, Ser. No. 439,789
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **2 Claims**



1. A tractor trailer aerodynamic drag reducer for use on the tractor roof of a tractor cab comprising:

a deflector panel having a leading edge and laterally spaced apart side edges;

hinge means mounting the leading edge of the deflector panel on the roof to permit pivotal movement of the deflector panel relative to the roof;

means acting between the deflector panel and the roof to effect pivotal movement of the deflector panel;

an air deflecting side member extending vertically between each side edge of the deflector panel and the roof, said side members being a flexible foldable material folding and unfolding to accommodate pivotal movement of the deflector panel and having top edges attached to the deflector panel and bottom edges attached to the roof;

guide means attached to the deflector panel and depending therefrom adjacent to the side members;

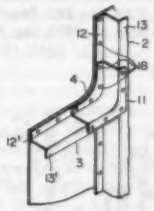
and guide follower means attached to the side members intermediate the top and bottom edges thereof and slidably inter-engaged with the guide means to guide folding and unfolding of the side members upon pivotal movement of the deflector panel relative to the roof.

4,462,629

CONSTRUCTION OF CAR STRUCTURE

Seijiro Todori, and Minoru Tanaka, both of Kudamatsu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,602
Claims priority, application Japan, Nov. 11, 1981, 56-179689
Int. Cl.³ B62D *27/02*
U.S. Cl. 296—30 **9 Claims**



1. A construction of a car structure, comprising:

an outside plate;

a vertical structural member located in a car body against the outside plate in a vertically oriented parallel relationship thereto and a horizontal structural member located in said car body against said outside plate in a horizontally oriented parallel relationship thereto, said vertical structural member and horizontal structural member each including an outside portion and an inside portion oriented parallel to the outside plate and a web extending normal to said outside plate, between said outside and inside portions, to maintain the inside and outside portions of the structural members at a predetermined spacing interval; and

a joint member for joining said vertical and horizontal structural members together;

wherein the improvement resides in that:

said joint member includes a first flange portion extending parallel to said outside plate in the vicinity of the outside portions of both of said vertical and horizontal structural members, a second flange portion extending along the inside portions of both of said vertical and horizontal structural members parallel to said outside plate, and a web extending between said flange portions in such a manner that the flange portions are spaced apart by the web by a spacing interval corresponding to the width of the webs of the vertical and horizontal structural members; and

said flange portions extending in opposite directions with respect to the web of said joint member and being formed integrally therewith.

4,462,630

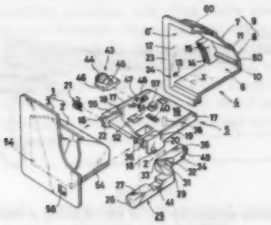
ASHTRAY DEVICE

Nobuaki Omata, Hiroshima, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Dec. 14, 1981, Ser. No. 330,049
Claims priority, application Japan, Dec. 17, 1980, 55-177119
Int. Cl.³ B60N *3/12*
U.S. Cl. 296—37.9 **4 Claims**

1. A pivotally retractably extendible ashtray device comprising: a housing; an ashtray unit removably securable within and

partially rotatable relative to said housing, said ashtray unit pivotally affixable to, disposable within and extendible from said housing; track means carried by said housing and engageable by said ashtray unit for guiding rotative motion of said ashtray unit between open and closed postures relative to said housing; a first spring disposed within said housing for urging said ashtray unit out of said closed posture; restraint means carried by one of said ashtray unit and said housing and engageable with the other one of said ashtray unit and said housing for resisting said urging of said first spring upon said ashtray unit thereby maintiaining said ashtray unit in said closed posture; restraint-removal means disposed within said housing for disengaging said restraint means from said other one of said



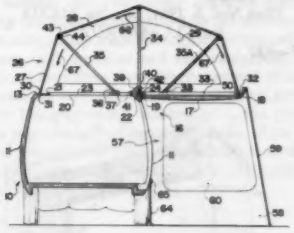
ashtray unit and said housing thereby causing said first spring to urge said ashtray unit out of said closed posture; means disposed within said housing for regulating said rotative motion of said ashtray unit between said open and closed postures; means disposed within said housing for dampening said urging of said first spring relative to said ashtray unit, said dampening means coacting with said first spring and said regulating means; and a second spring disposed within said housing and engageable with one of said restraint means and said restraint-removal means for causing said restraint means to re-engage with said other one of said ashtray unit and said housing, whereby said ashtray unit is rotatably extendible from and retractable within said housing.

4,462,631

EXPANDABLE VAN TOP TENT ASSEMBLY

Jack Lange, Winnipeg, Canada, assignor to Expandable Van Tops Ltd., Winnipeg, Canada

Filed Mar. 24, 1982, Ser. No. 361,442
Int. Cl.³ B60P 3/32
U.S. Cl. 296—160 **38 Claims**



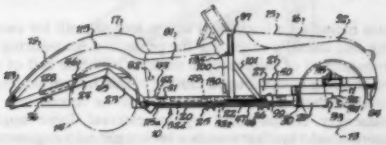
1. In a van or other vehicle which includes a body having sides, ends and a roof and having a substantially rectangular opening within said roof defined by a pair of spaced and parallel longitudinally extending edges and a pair of spaced and parallel transverse edges; the improvement comprising in combination a cover panel hinged by one side thereof to one side edge of the roof defining the opening therein and movable between a closed position covering the opening to an open position extending substantially horizontally from the one side edge of the roof and vice-versa, a flexible enclosure secured by the lower edges thereof to the other edges of the roof defining the opening and to the free sides of the cover panel, a plurality of substantially U-shaped hoop braces hinged by the ends thereof to the transverse edges defining the opening within the roof and to the transverse edges of the cover panel respectively, means to secure said enclosure to said hoops whereby, when said cover panel is opened, said hoops are erected by said enclosure, means to detachably latch said cover panel in the closed position and cantilever support structure supporting said cover panel in the open, horizontal position.

4,462,632

FRAME FOR INTERPRETATION OF CLASSIC AUTOMOTIVE VEHICLE AND METHOD OF FABRICATING VEHICLE

Carl J. Grassl, Sr., 34 Wheaton Dr., Cheektowaga, N.Y. 14225

Filed Feb. 25, 1982, Ser. No. 352,108
Int. Cl.³ B62D 21/02
U.S. Cl. 296—187 **14 Claims**



1. An automotive vehicle frame construction comprising a main frame extending in a direction longitudinally of said automotive vehicle and comprising first and second spaced longitudinal frame members, outrigger frame means mounted on said main frame means and extending outwardly thereof for supporting body members of said automotive vehicle, a cross member on said spaced longitudinal frame members located forwardly of said outrigger frame means, a pair of spaced front fenders having front portions and rear portions, first flanges on said front portions of said front fenders, said first flanges being oriented horizontally and extending toward each other and overlying said cross member, first bolt means securing said first flanges to said cross member, second flanges on said rear portions of said fenders, said second flanges being oriented horizontally and extending inwardly from said fenders toward said first and second spaced longitudinal frame members and overlying said outrigger frame means, second bolts extending through said second flanges and said outrigger frame means for securing said second flanges to said outrigger frame means, said cross member comprising a horizontal plate between said first and second spaced longitudinal frame members, said horizontal plate including vertical flanges at its opposite ends, a plurality of vertical slots in each of said vertical flanges, and third bolts extending through said vertical slots and said first and second spaced longitudinal frame members for adjustably mounting said horizontal plate on said main frame means.

4,462,633

DOOR STOP ARRANGEMENT FOR A VEHICLE

Kouzo Maeda, Yokosuka, Japan, assignor to Nissan Motor Co., Limited, Yokohama, Japan

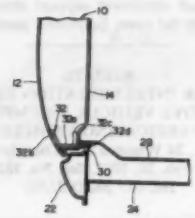
Filed Jun. 28, 1982, Ser. No. 392,522
Claims priority, application Japan, Jul. 3, 1981, 56-99938[U]
Int. Cl.³ B62D 25/04
U.S. Cl. 296—188 **4 Claims**

1. A door stop arrangement in a vehicle having a hinged side door which is operable to open and close a door opening defined above a side sill mounted on a lateral side of a vehicle floor panel, said door stop arrangement comprising:

a reinforcing member robustly mounted onto said floor panel with its one end located at said side sill;

a bracket member securely mounted to and movable with said hinged side door at a portion which is engageable

with the end of said reinforcing member when said door assumes its closed position, said bracket member comprising a base portion attached to a lower flat section of the door inner panel, an inclined outer flange portion attached to the door outer panel, two spaced upright flange portions attached to an upright portion of the door inner panel, and a laterally extending flat projection; and



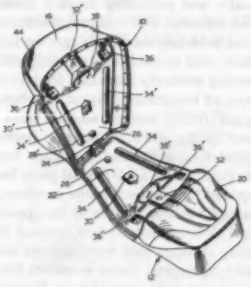
means including a horizontal slot in said side sill for receiving said laterally extending flat projection for assuring the engagement of said bracket member with the end of said reinforcing member upon closing of said hinged side door, whereby when said side door tends to be forced into the passenger compartment by an external force applied thereto, said bracket member is brought into engagement with the end of said reinforcing member thereby preventing said door from continuing its inward movement.

4,462,634

ADJUSTABLE MOTORCYCLE SEAT

Michael W. Hanagan, San Jose, Calif., assignor to Corbin Pacific Inc., Watsonville, Calif.

Filed Aug. 18, 1982, Ser. No. 409,295
Int. Cl.³ B62J 1/00
U.S. Cl. 297—201 **7 Claims**



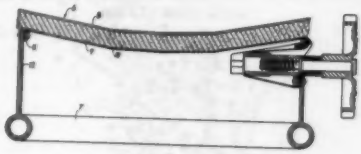
1. A two-part seat assembly for a motorcycle or like vehicle, comprising: a passenger's seat including an elongated principal base having means thereon for attachment to the frame of the vehicle, and having a seat member thereon adjacent one end thereof; an operator's seat disposed on said principal base towards the other end thereof from said passenger's seat member, said operator's seat including a secondary base; means hingedly connecting said principal base and said secondary base adjacent said other end of said principal base, said operator's seat being pivotable about said means between a lowered position thereof, with said secondary base lying closely adjacent said principal base, and an elevated position in which said secondary base is inclined upwardly therefrom, at least one of said seats having adjustable means thereon providing underlying support for said operator's seat in at least said elevated position thereof, said operator's seat including a seat member comprised of a seat portion and lateral skirt portions depending along the opposite sides thereof, said skirt portions being dimensioned and configured to extend in the direction of said principal base a distance that is sufficient to substantially conceal said base in both of said operator's seat positions.

4,462,635

SEAT WITH ADJUSTABLE BACK SUPPORT

Mark A. Lance, 405 Moreland Rd., Pascoe Vale South, Victoria, Australia

Filed Feb. 13, 1981, Ser. No. 234,285
Claims priority, application Australia, Feb. 29, 1980, PE2604
Int. Cl.³ A47C 7/46, 3/00
U.S. Cl. 297—284 **8 Claims**



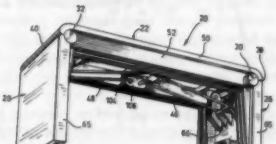
1. An adjustable assembly for a seat having a back support with peripheral frame and a base, said frame including two substantially rigid portions spaced apart a predetermined distance defining a support region, said assembly comprising flexible means spanning said distance between said portions and actuating means between said portions for controlling tension in said flexible means, said flexible means having one end fixedly secured to one of said portions, an intermediate portion slidably supported on a part of the other of said rigid portions and disposed over said actuating means, and an opposite end fixedly secured to another part of the other of said rigid portions, said actuating means adapted to shift said intermediate portion to induce or relieve tension in said flexible means, threaded means for moving said carrier means whereby an adjustable assembly positioned proximate the lumbar region of said back support permits adjustment of the amount of protrusion of said back support across the entire predetermined distance.

4,462,636

FOOTSTOOL

Morley Markson, Toronto, Canada, assignor to Yorkvest Limited, Toronto, Canada

Filed Nov. 5, 1981, Ser. No. 318,513
Int. Cl.³ A47C 9/12
U.S. Cl. 297—439 **9 Claims**



1. A footstool comprising:

a platform having an upper, foot supporting surface;

a pair of legs adapted to support the platform in an elevated position above a surface on which the foot-stool is disposed;

hinge means coupling the legs to the platform at positions spaced along the platform, the hinge means permitting movement of the legs between operative positions in which the legs extend outwardly from the platform for

supporting the same, and inoperative positions in which the legs are folded inwardly below the platform, the platform and legs being shaped to define a generally flat configuration when the legs are folded inwardly;

stop means preventing outward movement of the legs beyond said operative positions; and,

bracing means capable of maintaining the legs in their operative positions against said stop means, said bracing means comprising, in association with each leg, a ramp structure provided at the inner side of the respective leg and defining an inclined outer surface, and a strut pivotally coupled adjacent a first end thereof to the underside of the platform and having a second, distal end co-operable with the ramp structure of the relevant leg for bracing the leg in said operative position, the strut being pivotal about its said first end between a leg bracing position and an inoperative position in which the leg can fold inwardly against the platform, and the strut and the ramp structure being arranged so that, as the strut moves from its inoperative position to its bracing position, the distal end of the strut initially engages the respective inclined surface at a position intermediate its ends.

4,462,637

CONTROL APPARATUS FOR INCLINATION OF LONGWALL GUIDE

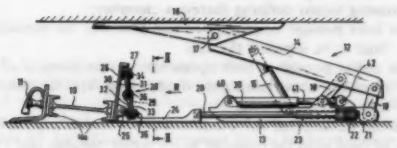
Werner Rafael, Lunen, and Egon Pfefferle, Hamm, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,911

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047064

Int. Cl.³ E21C *35/08*; E21D *23/04*

U.S. Cl. 299—32 **3 Claims**



1. Apparatus for controlling the inclination of mineral mining equipment, said apparatus comprising an abutment member pivotally attached to the equipment, means carried by said abutment member and operatively engaging said equipment for pivoting the equipment relative to the abutment member, said means comprising: a double-toggle linkage and a hydraulic ram between said abutment and said equipment, said toggle linkage having four links pivotably connected in the form of a parallelogram by two pairs of opposed pivot joints, the hydraulic ram being pivotably connected to the pivot joints of one of said pair of opposed pivot joints, one of the pivot joints of the other pair of pivot joints being attached to the abutment member and the other pivot joint of said other pair of opposed pivot joints being attached to said equipment.

4,462,638

MINING BIT WITH IMPROVED SPLIT RING RETAINER

Leroy E. DenBesten, P.O. Box 344, Valatie, N.Y. 12184

Filed Dec. 30, 1981, Ser. No. 335,879

Int. Cl.³ E21C *35/18, 25/46*

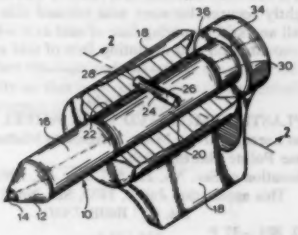
U.S. Cl. 299—86 **4 Claims**

1. For use in a cutting machine device or the like having a mount with a tubular cylinder socket, a bit having:

cylindrical shank having a front cutting end and rear end with a channel portion said ends;

split cylindrical spring sleeve located in said channel portion and adapted to be disposed in and engageable with the socket over substantially all of the shank disposed in the socket so as to accept wear therebetween, said sleeve having diameter greater than the diameter of the shank adjacent the sleeve when said sleeve is disposed on the shank and in the socket so as to allow rotation of the shank in the socket; said sleeve also having a diameter sized so as to maintain the sleeve in the channel portion upon insertion of the bit into the socket and extraction of the bit from the socket;

retaining means engageable with the sleeve and the mount with said sleeve and mount having respective receptacles for said means which when disposed therein provides a



retaining force on sleeve and accordingly said bit in addition to any retaining force due to engagement of the sleeve and the socket so as to prevent premature ejectment of the bit from the socket; and

wherein when the bit with sleeve is placed in the socket and the means is located in the receptacles, said sleeve is non-rotational in said socket while allowing rotation of the bit in the socket and accepts substantially all of the wear on the socket resulting from interaction as between the bit and the socket and said means is disposed in the receptacle of the sleeve and prevents ejectment of the bit from the socket during operation of the device.

4,462,639

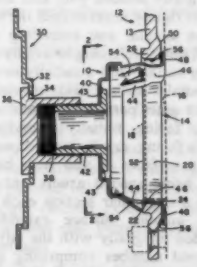
WHEEL COVER SUPPORT PEDESTAL

Roy C. Holmstrom, Lake Orion, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1982, Ser. No. 402,500

Int. Cl.³ B60B *7/06*

U.S. Cl. 301—37 SC **4 Claims**



1. A wheel cover support pedestal capable of being mounted centrally on a wheel of the type which includes a radial wall with a central hole therethrough, said hole being capable of snuggly receiving a circular hub element of an axle therein when said wheel is mounted on a mounting face of said axle, said hole being defined by an interior periphery of said radial wall to be generally circular with said periphery including a plurality of circumferentially spaced notches to provide a gap between said periphery at each of said notches and said circular hub element, said wheel cover support pedestal comprising:

a center portion including means for securing a center section of a wheel cover thereto;

a plurality of leg portions extending from said center portion, each of said leg portions being capable of being aligned with one of said plurality of said notches and including an extended end being received within a corresponding said gap; and

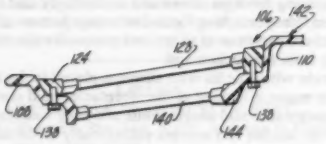
said extended end having a radially extending foot to make overlying contact with an inboard side of said radial wall adjacent said gap to cause said center portion to be disposed axially outwardly of an outboard side of said radial wall of said wheel when said wheel cover support pedestal is mounted thereon, said radially extending foot being tightly secured between said inboard side of said radial wall and said mounting face of said axle when said wheel is mounted on said mounting face of said axle.

4,462,640

PLASTIC SIMULATED WIRE WHEEL COVER

Norman Loren, Warren, Mich., assignor to Michael Ladney, Jr., Grosse Pointe Shores, Mich.

Continuation of Ser. No. 258,577, Apr. 29, 1981, abandoned.
This application Jul. 8, 1983, Ser. No. 512,109
Int. Cl.³ B60B 7/04
U.S. Cl. 301—37 P **1 Claim**



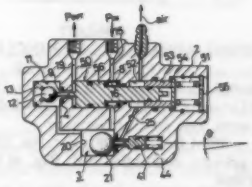
1. A vehicle wheel cover which simulates a wire wheel comprising, first and second molded plastic members of circular shape secured together in axially juxtaposed relation, said first member having a circumferentially continuous annular section around the outer periphery thereof, said annular section having means thereon for frictionally retaining the cover on a vehicle wheel, said first member also having an axially outwardly projecting, rigid, circular cylindrical central hub, said hub including an axially outwardly extending, annular surface and a radially extending annular surface at the axially outer edge thereof, means including spokes extending radially between and integrally molded with said annular section and said central hub to rigidly interconnect the same, said annular section having an annular seat extending around the inner periphery thereof, said seat having an axially outwardly facing, radially extending surface and a radially inwardly facing and axially inclined annular surface, said hub also having an annular seat around the outer periphery thereof which includes an axially outwardly facing, radially extending surface and a radially outwardly facing, axially inclined annular surface, the radially extending surfaces of said seats being spaced apart axially and also being spaced axially outwardly from said spokes, said hub and annular section each having a second axially inclined, annular surface extending continuously around and molded integrally with the adjacent ends of the spokes, said second member comprising a pair of radially spaced concentric annular rims interconnected by radial spokes molded integrally therewith, each rim having at the axially inner face thereof a radially extending surface, the outer rim having around its outer periphery an axially extending annular surface similarly inclined to the axially extending surface of the seat on said annular section, said inner rim having around its inner periphery an axially extending surface similarly inclined to the axially extending surface of the seat on said hub, the radially extending surfaces on said rims being seated against the radially extending surfaces on said seats and the axially inclined surfaces on said rims being seated with a radially close fit against the axially inclined surfaces of the seats to positively locate both rims of the second member on the respective seats of the first member in both axial and radial directions, each rim also having an axially outwardly facing, radially extending surface which forms in part the visible, axially outer face of the wheel cover, said hub projecting axially outwardly through the axially outer face of said inner rim, and means interconnecting said rims with said first member at said seats.

4,462,641

DECELERATION SENSING VALVE ASSEMBLY FOR VEHICLE BRAKE

Hidefumi Inoue, Omiya, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 234,122, Feb. 13, 1981, Pat. No. 4,397,506.
This application May 16, 1983, Ser. No. 495,305
Claims priority, application Japan, Feb. 13, 1980, 55/16210
Int. Cl.³ B60T 8/14
U.S. Cl. 303—24 C **17 Claims**



1. A deceleration sensing valve assembly for regulating brake fluid pressure in a vehicle movable in a forward direction, comprising:

housing means defining therein a chamber;

an inlet passage opening into said chamber for permitting fluid to be supplied thereto;

an outlet passage which opens into a rear portion of the chamber for permitting the fluid to flow from the chamber into the outlet passage;

an inertia-actuated valve mechanism for controlling the flow of fluid from the chamber to the outlet passage, said valve mechanism including a valve body movably disposed within said chamber and engageable with a valve seat positioned rearwardly of the valve body relative to the forward direction of the vehicle, said valve seat being disposed in surrounding relationship to the opening of the outlet passage, said valve body being normally gravity-urged toward a position of seating engagement with the valve seat, said valve body tending to move under its own inertia forwardly away from the valve seat in response to vehicle deceleration of a given value as caused by (1) a first predetermined brake fluid pressure when decelerating an empty vehicle and (2) a second predetermined brake fluid pressure when decelerating a loaded vehicle, said second predetermined pressure being greater than said first predetermined pressure; and

fluid pressure responsive control means for controlling flow of fluid from said chamber into said outlet passage, said control means including a control member which is movable in response to fluid pressure from a first position wherein said control member maintains said valve body spaced forwardly from and out of engagement with said valve seat into a second position wherein said control member permits said valve body to move under the urging of gravity into engagement with said valve seat, said control member being normally biased into said first position and being moved into said second position in response to imposition of a third predetermined fluid pressure thereon which is greater than said first predetermined pressure but less than said second predetermined pressure;

whereby deceleration of an empty vehicle permits said valve body to move by inertia in a forward direction away from said control member so that the valve mechanism remains open even when the fluid exceeds said third predetermined pressure, whereas when decelerating a loaded vehicle the fluid exceeds said third predetermined pressure and causes the control member to move into its second position so that the valve body seats against the valve seat so as to close off the valve mechanism and the fluid within the chamber then acts against the valve body and assists in holding it against the valve seat even if the fluid exceeds said second predetermined pressure.

4,462,642

VEHICLE BRAKE SYSTEM

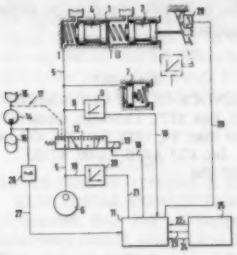
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 382,456

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124755

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—119 **18 Claims**



1. A vehicle brake system having a main cylinder which supplies hydraulic pressure to hydraulic brake cylinders associated with the vehicle wheels, said system further having an anti-wheel-lock apparatus and includes a multiple-position valve for switching a line passage to the brake cylinders, and controlling a servopressure supply apparatus, characterized in that said main cylinder and the servopressure supply apparatus are connected in parallel to said multiple-position valve, said system further including a pair of pressure gauges with one gauge disposed before said multiple-position valve, said pressure gauges arranged to receive hydraulic fluid under pressure and to emit output signals which are compared with one another in an electronic braking comparison unit and further wherein the result of comparison can be delivered as a control signal to said multiple-position valve.

4,462,643

TAPERED ROLLER BEARING CAGE WITH SPIN RESISTING CHARACTERISTICS

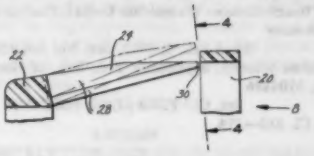
George G. Gilbert, Farmington, Mich., and Richard O. Dimit, North Canton, Ohio, assignors to The Timken Company, Canton, Ohio

Filed Sep. 16, 1981, Ser. No. 302,502

Int. Cl.³ F16C *33/46*

U.S. Cl. 308—202 **9 Claims**

1. A cage for a roller bearing that has an inner race provided with a raceway and rollers arranged in a row around the raceway, said cage being formed from a flexible polymer and comprising: a first end ring, a second end ring, and bridges extending between the end rings to form pockets that are large enough to receive the outwardly presented portions of the rollers, yet are small enough to prevent the rollers from falling through the pockets, whereby the cage will hold the rollers about the inner race when the inner race is removed from an outer race, and means located asymmetrically on the cage for creating within the cage and rollers confined by the cage an imbalance of sufficient magnitude to prevent the cage and rollers from rotating at excessively high speeds around the inner race when the cage and the rollers are subjected to a jet of high velocity air that is directed generally tangentially at the cage in the absence of an outer race.



4,462,644

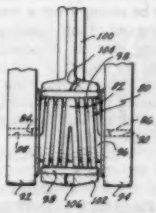
BEARING UTILIZING HELICAL INSERT

Jack S. Conner, 22190 Saddle Peak Rd., Topanga, Calif. 90290

Continuation-in-part of Ser. No. 235,835, Apr. 10, 1981, abandoned. This application May 17, 1983, Ser. No. 495,444

Int. Cl.³ F16C *33/58*

U.S. Cl. 308—207 R **29 Claims**



1. An apparatus for a low frictional connection between a first element rotating with respect to a second element which comprises:

said first element including a cylindrical convex journal surface;

said second element including a cylindrical concave receptacle surface;

said convex journal surface sized to fit into said concave receptacle surface and when fitting into said receptacle surface being spaced away from said receptacle surface;

a helical member having an internal concave helical surface and an external convex helical surface, each of said internal and said external helical surfaces forming portions of concentric right circular cylinders, said helical member sized to fit around said journal surface and within said receptacle surface;

said internal helical surface abutting against said journal surface, said external helical surface and said receptacle surface coaxial with each other and spaced away from each other forming a gap between each other;

a bearing means fitting into said gap and movably located against said helical member to provide a working connection between said first and said second elements, said bearing means and said helical member moving with respect to one another in response to rotational movement of said first and said second elements with respect to one another.

4,462,645

COOLING APPLIANCE, ESPECIALLY A HOUSEHOLD REFRIGERATOR OR THE LIKE

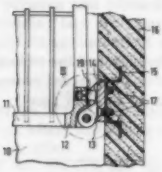
Jürgen Ballarin; Detlef Cieslik, both of Giengen, and Werner Reichel, Heidenheim, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 2, 1982, Ser. No. 344,923

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104186

Int. Cl.³ F25D *11/00*; **E05C** *9/06*

U.S. Cl. 312—214 **3 Claims**



1. Cooling appliance, comprising a housing having an opening formed therein, at least one door for sealing said opening, at least one first bearing part fixed on said housing in vicinity of said opening, at least one second bearing part being movably disposed on and at least partially axially insertible into said first bearing part from above, at least one supporting tray disposed in said housing and having a given region being disposed on said at least one second bearing part, said supporting tray having a curved portion opposite said given region for permitting said tray to be swung from a rest position to a position at least partly swung out of said housing when said door is open, a shaped damping element disposed on one of said bearing parts for damping the impact of said tray when swung into said rest position, and a shaped retaining element disposed on the other of said bearing parts for catching said damping element and axially interlocking said bearing parts when said tray is swung into said rest position.

4,462,646

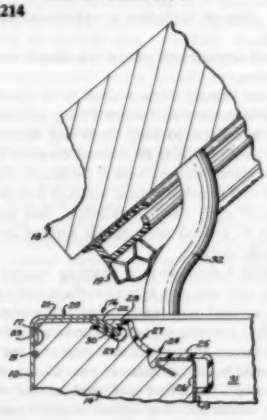
INSULATED CABINET CONSTRUCTION FOR CHEST FREEZERS

George J. Fleck, Arnegard, N. Dak., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 29, 1982, Ser. No. 428,415

Int. Cl.³ F25D *11/00*

U.S. Cl. 312—214 **15 Claims**



1. In an enclosure structure including a cabinet defined by an insulative wall having an outer shell, an inner liner defining with said shell an intermediate insulating space, and thermal insulation in said space, said wall having an edge portion defining an access opening, and a closure movably mounted to the cabinet for selectively closing said access opening and having a projecting sealing gasket, improved means for closing an end of said space, comprising:

an edge portion of the shell defining a flange having an outer portion extending perpendicularly partially across said end of the space toward the liner and having a turned distal end extending angularly inwardly into said space to terminate within said end of the space; and

a breaker collar having a mounting portion secured to an edge portion of the liner at said end of the space, a distal portion secured to said turned distal end of the shell flange within said end of the space and a gasket-wiping surface portion extending parallel to said flange outer portion within said space to be disposed inwardly of the plane of said flange outer portion, whereby said closure sealing gasket may wipe against the connected shell flange and said breaker collar surface portion for selective wiping sealed engagement therewith, with the shell flange and breaker collar being free of projection impediment to said sealed engagement.

4,462,647

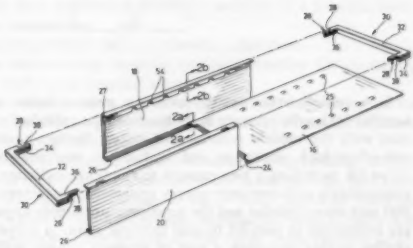
KNOCK-DOWN CUPBOARD

Gerald Key, P.O. Box 1377, Uxbridge, Ontario, Canada

Filed Mar. 14, 1983, Ser. No. 475,161

Int. Cl.³ A47B *43/00*, *47/02*

U.S. Cl. 312—257 SM **2 Claims**



1. A boltless sheet metal cupboard or cabinet assembly having:

a top wall;

a bottom wall;

a back wall;

and opposed side walls;

a flange on the back longitudinal edge of each side wall, a hem on the edge of each flange that forms a U-configuration with its open end facing its respective side wall;

a hem on each of the side edges of said back wall that forms a U-configuration with its open end facing the open end of the hem on the other side edge, the hems on the back wall and the hems of the side walls being adapted to interlock with each other;

an open front;

a door hingeable to close the open front;

the front longitudinal edge of each side wall being formed with a channel;

a rigidifying top bar having a stab connector at each of its ends for entry into the channel of one of the side walls whereby to extend between the side walls at the top front and space them apart in operative position in use;

a rigidifying bottom bar having a stab connector at each of its ends for entry into the channel of one of said side walls

whereby to extend between the side walls at the bottom front and space them apart in operative position in use;

the top wall having downwardly extending flanges along each of its edges;

the downwardly extending flange along the front edge of the top wall having an inwardly projecting locking flange at its lower edge adapted to snap over the lower marginal edge portion of the edge of the rigidifying top bar;

the downwardly extending flange along the back edge of the top wall having a hem that forms a U-configuration with its open end facing upwardly;

the upper edge of the back wall having an outwardly directed hem that forms a U-configuration with its open end facing downwardly that is adapted to interlock with the hem on the flange on the back edge of the top wall;

each of the back wall and side walls having an inwardly directed channel at their lower edges;

the bottom wall having an L-shaped flange along its back and side edges adapted to drop into said channels on the lower edges of the back and side walls with a slide fit;

the bottom wall having a downwardly extending L-shaped flange at its front edge to embrace the front face and the marginal area near the front face of the bottom surface of the bottom rigidifying bar in use, said downwardly extending flange of said top wall at its back edge being formed with lug means, said lug means being depressable with respect to the plane of the flange to limit movement of the upper edge of the back wall with respect to the side walls in use.

4,462,648

APPARATUS FOR PROVIDING A RELIABLE ELECTRICAL CONNECTION

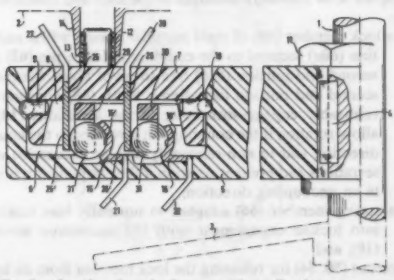
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,529

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110807

Int. Cl.³ H01R *39/00*

U.S. Cl. 339—3 S **9 Claims**



1. Device for the electrical connection of at least two structural elements which are arranged on a steering wheel axis of a motor vehicle and rotatable with respect to each other, which comprises a first structural element having a first contact element attached to a steering shaft and rotatable therewith, a second structural element having a stationary second contact element adjacent the first contact element and spaced from the first contact element to allow for the insertion of rolling bodies, a plurality of rolling bodies made of an electrically conducting material for electrical connection between the first and second contact elements, and means for urging the first and second contact elements into contact with the rolling bodies, said rolling bodies being in the form of balls retained in cages, said balls being positioned in engagement with at least said first and second contact elements to form contact tracks for electrical supply and return lines, said first and second contact elements being ring-shaped with axially extending connection elements, at least two concentric, ring-shaped contact element pairs being provided for the electrical supply and return lines, said ring-shaped contact elements being of different diameters with said rolling bodies interposed therebetween and with the ring-shaped contact elements being elastically pressed against said rolling bodies in a radial direction, at least one ring-shaped contact element in each contact element pair being radially elastic.

4,462,649

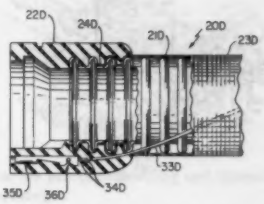
HOSE CONSTRUCTION AND METHOD OF MAKING SAME

Richard D. Medford, and Jerry W. Cooper, both of Waynesville, N.C., assignors to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 146,556, May 5, 1980, Pat. No. 4,415,389. This application Sep. 20, 1982, Ser. No. 419,861

Int. Cl.³ H01R *4/64*

U.S. Cl. 339—16 R **13 Claims**



1. In a hose construction comprising a flexible corrugated hose made of polymeric material and having a plurality of outwardly convex projections with recesses therebetween and extending from one end thereof to the other end thereof, a pair of hose connectors fixed to opposite ends of said hose, and a sleeve disposed around said hose and having opposite end portions, the improvement in which said sleeve is fastened to said hose only at its opposite end portions by having each opposite end portion sandwiched between said hose and its respective hose connector so that each hose connector holds its respective end portion of said sleeve in sandwiched relation against at least one projection of said hose and against at least one recess of said hose that is adjacent to said one projection, said hose connectors being molded connectors and said opposite end portions of said sleeve being bonded against said molded connectors, said sleeve making only substantially circular line contact with said projections between said end portions and being substantially taut between said end portions and substantially free of sags between said projections and over said recesses between said end portions, said hose connectors having internal threads which correspond to and are adapted to be threadedly received over said projections, and said opposite end portions of said sleeve being sandwiched between said internal threads and said projections, and said sleeve serving to improve the fluid pressure resistance and external wear resistance of said hose while keeping its flexibility substantially intact.

4,462,650

ELECTRICAL DISTRIBUTION SYSTEM

Michael Humphreys, Ealing, England, assignor to Electrak International Limited, England

Filed Mar. 4, 1982, Ser. No. 354,570

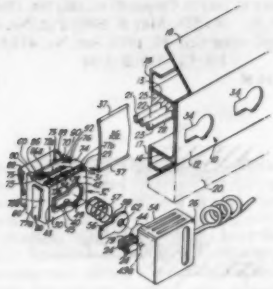
Claims priority, application United Kingdom, Mar. 12, 1981, 8107821

Int. Cl.³ H01R *13/60*

U.S. Cl. 339—22 R **9 Claims**

1. An electrical distribution system of the kind comprising a hollow conduit having walls defining a longitudinally-extending enclosure and having a plurality of continuous electrical

conductors disposed within said enclosure, at least one of said conductors being a live conductor; aperature means in one wall of said conduit defining a plurality of longitudinally spaced entry positions for access to the enclosure; a self-contained, unitary safety closure assembly disposed within the enclosure at each of said entry positions to receive a connecting plug and provide for selective access between said plug and said conductors the assembly including a housing having formed therein a first aperature aligned with and substantially coextensive with the aperture means in said one conduit wall, first door means normally closing said first aperture but resiliently movable to an open position by insertion of said connecting plug, said housing having second aperture means formed therein and aligned with said conductors for providing access



from the interior of said housing to said conductors, safety door means movable from a normally closed position in which access to the conductors from the interior of said housing is prevented, to an open position in which access to the conductors can be achieved; said safety door means including operator means engageable with a portion of said plug for moving the safety door means from the closed to the open position upon manipulation of said plug in said housing, and a connecting plug having an element adapted for insertion through said aperture means and said first aperture at an entry position which element includes a plurality of contact pins and which is adapted when manipulated in the inserted position within said housing to move said safety door means into the open position to enable said contact pins to be brought into contact with said conductors.

4,462,651

REUSABLE HEAT-RECOVERABLE CONNECTING DEVICE

Thomas H. McGaffigan, Orinda, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 10, 1982, Ser. No. 436,201
Int. Cl.³ H01R *13/20*
U.S. Cl. 339—30 **16 Claims**

1. A reusable connecting device comprising:

an annular driver member having a continuous inside contact surface, said driver member being made from a heat-recoverable metal having a martensitic state and an austenitic state, said driver member being expanded radially outward while in its martensitic state, a change from its martensitic state to its austenitic state recovering said driver member to its non-expanded dimension; and

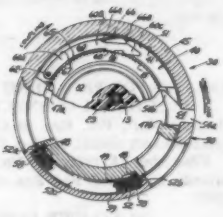
at least one circumferentially split annular spring biasing means inside and generally concentric with said driver member, said spring biasing means contacting and exerting a radially outward force against the inside contact surface of said driver member, said driver member overcoming said force when changed from its martensitic state to its austenitic state recovering to its non-expanded dimension causing engagement between said spring biasing means and a substrate that may be inserted inside of said spring biasing means, said spring biasing means expanding said driver member radially outward releasing such a substrate when said driver member changes from its austenitic state to its martensitic state.

4,462,652

COUPLING NUT FOR AN ELECTRICAL CONNECTOR

Dee A. Werth, Afton, and Alan L. Schildkraut, Sidney, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Aug. 3, 1981, Ser. No. 289,450
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—89 M **20 Claims**



1. A coupling nut for use with a cylindrical shell (**12**) having serrations (**18**) disposed therearound, said coupling nut being adapted to be rotatably mounted to the shell and characterized by:

a lock member (**60**) of rigid material having a first end portion (**60*a***) secured to the coupling nut by a pin (**62**) and a second end portion (**60*b***) free to pivot about the pin, the second end portion including a tooth (**68**) configured to releasably engage successive of the serrations (**18**) and allow rotation if the coupling nut is rotated in the coupling direction and to non-releasably engage successive of the serrations and prevent rotation if the coupling nut is urged in an uncoupling direction;

a spring member (**66**) adapted to normally bias tooth (**68**) into locked engagement with the successive serrations (**18**); and

means (**50, 54**) for releasing the lock member from its locked engagement with the serrations, said releasing means being normally disposed in spaced relation to said lock member and adapted to be rotated against the lock member for releasing.

4,462,653

ELECTRICAL CONNECTOR ASSEMBLY

Mark Fiederbach, Sidney, and David O. Gallusser, Oneonta, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 27, 1981, Ser. No. 325,519
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—89 R **19 Claims**

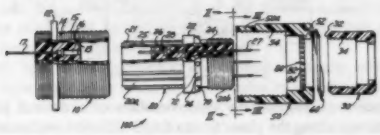
1. An electrical connector assembly including a pair of connector housings which are moveable along a primary axis from

an uncoupled position to a coupled position, a coupling ring rotatably mounted to one of said connector housings for drawing the other connector housing therewithin, and means for resisting rotation of the coupling ring, said resisting means characterized in that:

one of said connector housings includes a first surface (72);

said coupling ring includes a second surface (82) disposed in confronting relation to the first surface (72);

a plurality of equally spaced protuberances (74) extending outwardly from one of said surfaces (72), each said protuberance being comprised of an elastically deformable material and



a plurality of equally spaced sockets (84) extending inwardly from the other of said surfaces (82), each of said protuberances (74) and said sockets (84) being generally hemispherically shaped, the protuberances (74) being received within respective of the sockets (84) and each being required to elastically deform to advance into its next adjacent socket upon application of an external torque tending to rotate the coupling ring, whereby as the coupling ring is rotated each protuberance elastically deforms and advances to its next succeeding socket.

4,462,654

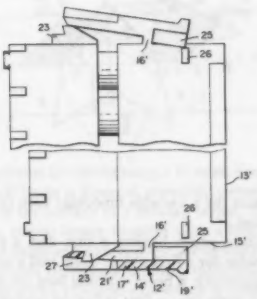
ELECTRICAL CONNECTOR HOUSING WITH INTEGRAL LATCH

Richard E. Aiello, East Petersburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 7, 1983, Ser. No. 464,448

Int. Cl.³ H01R *13/627*

U.S. Cl. 339—91 R **4 Claims**



1. An electrical connector housing moulded in one piece of plastics material comprising a latch member and a terminal receiving body, the latch member comprising a lever arm integrally joined intermediate its ends to a side wall of the body by a resilient web for pivoted movement between release and latching positions, a latch portion of the lever arm extending forwardly of the web to protrude from a mating face of the housing and a finger-engageable release portion of the lever arm extending rearwardly of the web and overlying the entire width of the side wall, stop means being provided on the release portion operative to prevent the release portion being pivoted towards the side wall beyond the release position, in which connector the web is located adjacent the rear of the lever arm and the stop means comprises flanges depending from the release portion in parallel planes beyond and adjacent opposite lateral edges of the side wall and lugs formed on respective opposite faces of the housing body which extend from the lateral edges of the side wall aligned for engagement with the respective flanges to prevent overstress.

4,462,655

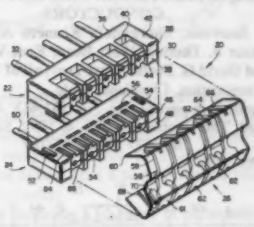
CABLE PRECONNECTORIZATION APPARATUS

Bruce D. Campbell, Portola Valley, and James T. Triplett, Livermore, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 258,078, Apr. 27, 1981, Pat. No. 4,428,115. This application Aug. 24, 1983, Ser. No. 526,175

Int. Cl.³ H01R *4/24, 9/03, 25/00*

U.S. Cl. 339—98 **5 Claims**



1. A connector for preconnectorizing and connecting cable core wires comprising:

first and second wire organizers, each of said wire organizers having means for securing a plurality of core wires; and

a contact element means for securing said wire organizers to each other, and for electrically interconnecting said core wires, said contact element means comprising a plurality of generally C-shaped contacts, each of said contacts having first and second ends, said contact element means being clamped around the outside of said organizers, the first end of each contact extending through the first wire organizer and gripping the second wire organizer, and the second end of each contact extending through the second wire organizer and gripping the first wire organizer, said ends being in overlapping relationship to secure the wire organizers to each other, the contacts electrically interconnecting said core wires.

4,462,656

INSTALLATION SYSTEM OF LABELED CONDUCTORS INCLUDING PLUGS AND CONNECTING CENTERS

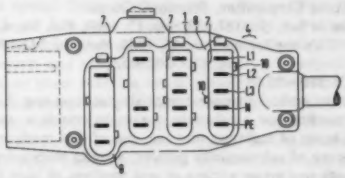
Dieter Beyer, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 13, 1981, Ser. No. 321,266

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044131

Int. Cl.³ H01R *13/50*

U.S. Cl. 339—154 A **20 Claims**



1. In a multiphase distribution system of labeled conductors

including plugs and connecting centers for flexible and permanent switch connections which form plug connections to a plurality of conductors the improvement comprising: said connecting center including a plurality of contact rails permanently connected to the leads of a flexible conductor for multiphase distribution; said contact rails forming a plurality of tongues for plug contacts in branch socket plugs; a housing having a plurality of single phase branch plug receivers for receiving the branch tongues in a recessed arrangement and forming protective collars adapted to be fitted to said branch plugs; at least one multiphase branch plug receiver for receiving a three phase alternating current plug and at least one main plug receiver being formed for connection to all of said contact rails.

4,462,657

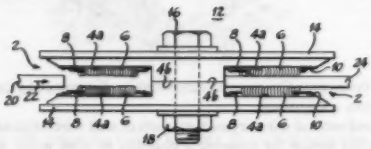
COMPLIANT ELECTRICAL CONNECTOR FOR FLAT CONDUCTORS

Albert C. Snowdon, Shorewood; Kenneth A. Forsell, Brown Deer; Peter J. Theisen, West Bend; Emil W. Zarling, Muskego, and David G. Porter, East Troy, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 141,443, Apr. 18, 1980, abandoned. This application Jun. 4, 1982, Ser. No. 384,838

Int. Cl.³ H01R *13/187*

U.S. Cl. 339—256 S **5 Claims**



1. An electrical connector for connecting separable, flat, electrically conductive members comprising:

at least one electrically conductive coil spring mounted on a flat surface of one of said conductive members, the longitudinal axis of said spring being parallel to said flat surface; and

means for positioning a flat surface of the other of said conductive members against said spring in electrical engagement therewith and deflecting the individual coils of said spring from their normal position;

said coil spring being mounted on said flat surface by an elongated mounting member which passes axially through said coil spring to extend beyond said spring at opposite ends thereof, the opposite ends of said mounting member being secured to said one of said conductive members, said mounting member having formations along its length for receiving the individual coils of said spring for restraining said individual coils against movement along said flat surface in the axial direction of said spring.

4,462,658

OPTICAL SCANNER

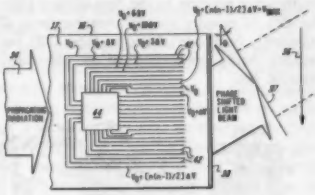
Donald R. Scifres, Los Altos; Robert D. Burnham, Los Altos Hills, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 187,912, Sep. 17, 1980, Pat. No. 4,360,921. This application Jan. 26, 1982, Ser. No. 342,950

Int. Cl.³ G02B *5/174*

U.S. Cl. 350—96.14 **3 Claims**

1. In an optical scanner comprising at least one thin waveguide medium on a substrate, means to couple a wide collimated beam of radiation into one end of said medium, a periodic array of substantially parallel, spaced electrodes associated with one major surface of said medium, at least a portion of the lengths of said electrodes extending in a direction substantially parallel with the direction of propagation of said radiation in said medium, means to apply voltages in a pattern to said electrodes which vary from one electrode to the next adjacent electrode to a predetermined value over several of said electrodes and wherein the same pattern of voltages or a similar pattern of different voltages is applied over several of the next of said electrodes to said predetermined value whereby the pattern is completed across said electrode array to



produce a corresponding approximation of a desired phase retardation along the phase front of said radiation and means to change the magnitude of said applied voltages across said electrodes to vary the approximation of the phase retardation to cause said radiation beam to scan in a direction transverse to the direction of propagation of said radiation in said medium.

4,462,659

PRISM SYSTEM FOR A VARIABLE BINOCULAR TUBE

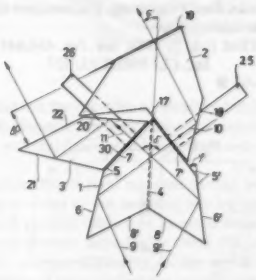
Johannes Grosser, 12, Ziegelmühlenweg, 69 Jena, District of Gera, German Democratic Rep.

Filed Oct. 23, 1981, Ser. No. 314,669

Claims priority, application German Democratic Rep., Dec. 23, 1980, 226553

Int. Cl.³ G02B *27/10*

U.S. Cl. 350—173 **3 Claims**



1. Prism system for a variable binocular tube comprising in optical alignment

a beam splitting prism having a first and a second light entrance plane for a first object beam and a second object beam, respectively, a beam splitting face for splitting said first object beam into a first reflected portion and into a first transmitted portion and said second object beam into a second reflected portion and into a second transmitted portion, and for fusing said first transmitted portion and said second reflected portion into a first fused object beam, and said second transmitted portion and said first reflected portion into a second fused object beam, and further having a first light exit plane and a second light exit plane for said first fused object beam and said second fused object beam, respectively,

said first and said second light entrance plane, and said first and said second light exit plane being substantially symmetrically to said beam splitting face,

a first eyepiece prism having a third light entrance plane, being substantially in parallel to said first light exit plane,

at least a first reflection plane, a third light exit plane for said first fused object beam,

means for displacing said first eyepiece prism substantially in parallel to said first fused object beam entering said first eyepiece prism by said third light entrance plane, and a second eyepiece prism having a fourth light entrance plane for said second fused object beam in parallel to said second light exit plane, at least a second and a third reflection plane, a fourth light exit plane for said second fused object beam,

means for displacing said second eyepiece prism substantially in parallel to said second fused object beam entering said second eyepiece prism by said fourth entrance face,

said third light exit plane and said fourth light exit plane being in parallel to each other,

said light entrance planes, said reflection planes and said light exit planes being at right angles to a common plane,

said first and second fused object beams after passing said third and fourth light exit planes, respectively, are in parallel to each other.

4,462,660

MODULATING A LASER BEAM

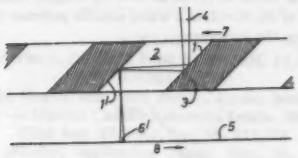
Jean Crahay, Francorchamps, Belgium, assignor to Centre De Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Aug. 6, 1982, Ser. No. 405,885

Claims priority, application Luxembourg, Aug. 6, 1981, 83535

Int. Cl.³ G05D *25/00*

U.S. Cl. 350—274 **34 Claims**



1. An apparatus for modulating a focused beam from a laser source, which beam is directed primarily perpendicularly to a given zone at the surface of a moving target, comprising:

an opaque planar rotary member with a first surface facing the laser beam and a second surface facing the target zone, said surfaces defining a uniform thickness, said member rotatable about a central axis which is substantially parallel to said laser beam and perpendicular to the target zone surface, and said member positioned between said laser source and said target surface zone;

means for rotating said member about its axis;

a plurality of apertures through said member, said apertures arranged in a concentric notional ring positioned so that said laser beam consecutively passes through said apertures when said member is rotated; and

each said aperture comprising first and second lateral walls defined by the thickness of said member, the plane of each of said walls being inclined relative to the axis of the laser beam, so that said first wall intercepts said laser beam when said member is rotated and deflects at least part of the beam from said given zone to a further zone of the target.

4,462,661

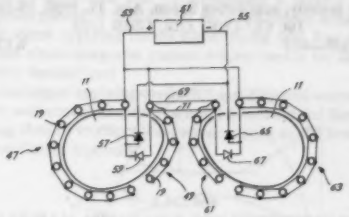
LASER PROTECTION GOGGLES

Frank Witt, West Columbia, S.C., assignor to Instrument Flight Research, West Columbia, S.C.

Filed Feb. 23, 1982, Ser. No. 351,504

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—331 R **7 Claims**



1. A laser ray eye protection device comprising:

voltage controlled lens means having a first state of transparency and a second state of opacity, said voltage controlled lens means being responsive to a switching signal for switching lens means from a normal state of transparency to a state of opacity;

detector means including a plurality of photocells mounted by suitable means along a path encompassing the perimeter of said lens, said detector means being responsive to detected radiation for generating an energizing signal whenever a laser ray crosses said path; and

switching means responsive to said energizing signal of said detector means for generating said switching signal.

4,462,662

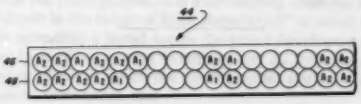
IMAGING SYSTEM UTILIZING A GRADIENT INDEX LENS ARRAY COMPENSATED FOR NON-UNIFORM OBJECT ILLUMINATION

William L. Lama, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 15, 1981, Ser. No. 274,020

Int. Cl.³ G02B *5/14*; G03B *27/00*

U.S. Cl. 350—413 **7 Claims**



1. An optical imaging system including a plurality of gradient index optical fibers combined into at least a single row to form a linear lens array, said array positioned between an object plane and a photosensitive image plane and adapted so as to transmit, and image, light reflected from an object lying in the object plane onto the image plane said array characterized by being comprised of at least two groups of optical fibers, a first group having identical gradient index value A and fiber radius R parameters, and a second group having at least one parameter value which varies from the parameter value of said first group, the fibers of both groups being distributed throughout the array so as to transmit therethrough a uniform level of said reflected object that resulting in a uniform exposure level at said imaging plane.

4,462,663

CONVERGING LIGHT TRANSMITTING BODY OF HIGH PERFORMANCE AND PROCESS FOR PRODUCTION THEREOF

Masayoshi Shimizu, Suita; Takashi Yamagishi, Itami, and Yukio Noguchi, Toyonaka, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Aug. 7, 1981, Ser. No. 290,965
Claims priority, application Japan, Aug. 11, 1980, 55-109982
Int. Cl.³ C03C *3/08*; G02B *5/14*
U.S. Cl. 350—413 **6 Claims**

1. A converging light transmitting glass body whose refractive index gradually changes from its central portion to its surface in a direction transverse to a path of light in such a way that when in an arbitrary phantom cross-section taken at right angles to a path of light, the following relation is established with regard to meridional rays

$$N(r) \cong N_0 \operatorname{sech}\left(\sqrt{A}\, r\right)$$

wherein A is a refractive index distribution constant, N_0 is a refractive index at the central point of the cross-section, and N(r) is a refractive index at a distance r from the central point, said glass body containing at least thallium, potassium and cesium cations constituting modifying oxides of the glass, the thallium and the potassium cations showing concentration changes of converse gradients from its central portion toward its peripheral surface, and the cesium cation showing no substantial concentration change at the central portion of the glass body but showing a substantial continuous concentration change outwardly thereof toward its peripheral surface.

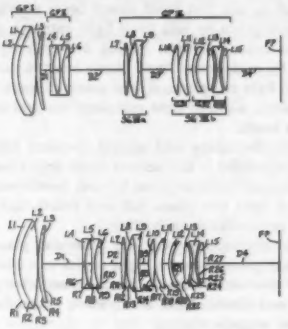
4,462,664

ZOOM LENS

Jacob Moskovich, Cincinnati, Ohio, assignor to Vivitar Corporation, Santa Monica, Calif.

Continuation-in-part of Ser. No. 82,010, Oct. 5, 1979, abandoned. This application Oct. 1, 1980, Ser. No. 189,591
Int. Cl.³ G02B *15/18*
U.S. Cl. 350—427 **37 Claims**

1. A zoom lens comprising from the object side a first positive grouping movable axially for focusing, a second negative grouping, and a third positive grouping, said second and third groupings being movable simultaneously axially of said lens but in the opposite direction for varying the equivalent focal length of said lens, said third grouping comprising a front and rear sub-groupings of positive optical power, said rear sub-grouping comprises three groups which from the object end



are of positive, positive and negative optical powers, successively.

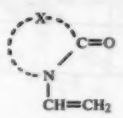
4,462,665

COMPOSITE HYDROGEL-FORMING LENS AND METHOD OF MAKING SAME

Kishore R. Shah, Chelmsford, Mass., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 229,653, Jan. 29, 1981, Pat. No. 4,369,229. This application Sep. 7, 1982, Ser. No. 415,571
Int. Cl.³ G02B *1/04*; G02C *7/04*
U.S. Cl. 351—160 H **2 Claims**

1. A hard contact lens comprising (A) two outer layers of an optically clear blend of (1) 40 to 98% by weight, based on the total weight of the blend, of a water-soluble polymer of a vinyl lactam having the structure

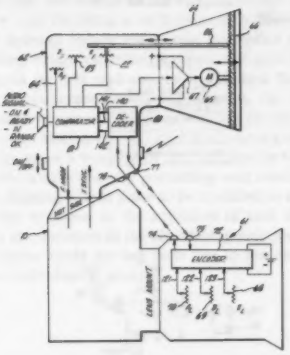


in which X represents an alkylene bridge having three to five carbon atoms, or a water-soluble copolymer thereof with 1 to 90 mole percent of copolymerizable monomer containing a polymerizing ethylenic unsaturation, said polymer or copolymer having a molecular weight from 10,000 to 1,000,000 and (2) 2 to 60% by weight of a water-insoluble copolymer consisting essentially of 50 to 90% by weight, based on the total weight of the copolymer, of a hydrophobic water-insoluble ethylenically unsaturated monomer, 2 to 12% by weight of an ethylenically unsaturated monomer containing an acid group, and 0 to 50% by weight of a hydrophilic ethylenically unsaturated monomer free from acidic groups, and (B) between said two outer layers and adherent thereto a layer of solid high molecular weight water-resistant polymeric material which is compatible with said vinyl lactam polymer or copolymer in the unhydrated state as determined by optical clarity of a mixture of said polymeric material with said vinyl lactam polymer or copolymer, said layers being in face to face adherent contact with each other, and said layers (A) being capable of absorbing more than 45% of their weight of water without dissolution at room temperature to form a hydrogel adherent to layer (B).

4,462,666
AUTOMATIC ZOOM FLASH

John M. Orban, Santa Monica, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Sep. 21, 1982, Ser. No. 420,709
Int. Cl.³ G03B 15/05
U.S. Cl. 354—126 11 Claims

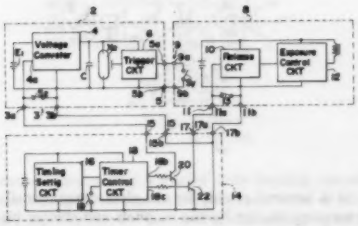


1. An automatic zoom flash system for use with a camera and lens comprising
- a flash unit having a flashtube for emitting a flash of light for taking a photograph
- focusing means disposed in a relationship with said flashtube for selectively changing the angle of the cone of light emitted by the flashtube,
- means responsive to a flash initiation signal for causing said flashtube to emit a flash of light, and
- control means responsive to the focal length of a lens disposed on the associated camera for causing said focusing means to change the angle of said cone of light as a function of the focal length of the lens.

4,462,667
CONTROL DEVICE FOR PERIODIC FLASH PHOTOGRAPHING

Akira Fujii, Osaka, and Norio Beppu, Kyoto, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 27, 1982, Ser. No. 412,374
Claims priority, application Japan, Sep. 24, 1981, 56-141683[U]
Int. Cl.³ G03B 15/05, 7/091, 15/03
U.S. Cl. 354—137 22 Claims

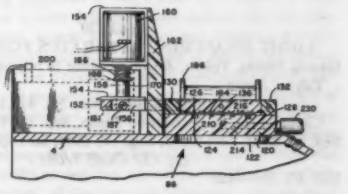


1. A control device for use with a camera having an electromagnetic camera release means and an electronic flash device including a battery cell, a flash tube, a main capacitor storing electricity for firing said flash tube and a voltage booster converter circuit with an oscillation transistor and a semiconductive switching element switchable to effect current supply to the base of said oscillation transistor for raising the voltage of said battery cell by the oscillation of said oscillation transistor to generate a high voltage applied to said main capacitor for the charging thereof, said control device comprising:
- actuation timing setting means for manually setting timed actuations of said camera;
- timer control means for generating a first signal at each said timed actuations and for generating a second signal a given period of time before each said timed actuations;
- first signal applying means for applying said first signal to said electromagnetic camera release means for the actuation thereof; and
- second signal applying means for applying said second signal to said semiconductive switching element for the switching thereof to effect the current supply to the base of said oscillation transistor.

4,462,668
HOLOGRAM APPARATUS FOR DETECTING FLAWS WITH DEVELOPING CHAMBER

John W. Newman, Wayne, Pa., assignor to Laser Technology, Inc., Norristown, Pa.

Continuation-in-part of Ser. No. 194,343, Oct. 6, 1980, abandoned. This application Jul. 20, 1981, Ser. No. 284,634
Int. Cl.³ G03D 3/02, 3/08
U.S. Cl. 354—317 5 Claims



1. A photographic station comprising:
- a transparent base plate;
- a transparent cover plate movable towards and away from the base plate,
- means for moving the cover plate towards and away from the base plate,
- means for sealing extending from the base plate,
- means for advancing a photographic film between the sealing means and the cover plate,
- said sealing means forming the periphery of a chamber between said base plate and the photographic film,
- means including said base plate and sealing means forming with the photographic film a developing chamber having a depth in the range of from about 0.005" to about 0.125" for spreading a liquid across the entire developing chamber by capillary action to remove any air from the developing chamber when the photographic station is at any spacial orientation, and
- a supply conduit and a discharge conduit connected to the chamber at substantially opposite points and adjacent the periphery of the chamber.

4,462,669
SELF-TIMER DEVICE FOR CAMERA

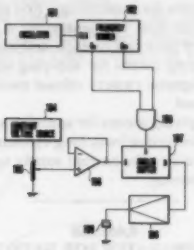
Nobuyuki Suzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1982, Ser. No. 407,279
Claims priority, application Japan, Aug. 18, 1981, 56-129174; Aug. 18, 1981, 56-122186[U]; Aug. 19, 1981, 56-130770; Dec. 17, 1981, 56-204956
Int. Cl.³ G03B 17/18; G08B 3/00
U.S. Cl. 354—400 10 Claims

1. In a camera with a display for the operation of a self-timer, an arrangement comprising:

(a) a sound producer incorporated in said camera;

(b) signal forming means for detecting the position of an object to be photographed for producing an output signal corresponding to the object position; and



(c) control means responsive to detection by said signal forming means of the object position becoming distant for increasing the volume of said sound producer.

4,462,670

LIGHT MEASURING APPARATUS FOR CAMERA

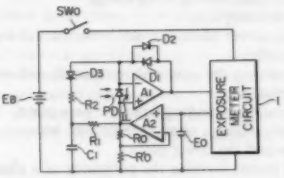
Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Sep. 13, 1982, Ser. No. 417,170

Claims priority, application Japan, Sep. 18, 1981, 56-146080; Sep. 18, 1981, 56-146081; Sep. 18, 1981, 56-146082

Int. Cl.³ G03B 7/081

U.S. Cl. 354—425 **21 Claims**



1. In a light measuring apparatus for a camera including a power switch, an operational amplifier, a photo diode connected between inversion and non-inversion input terminals of said operational amplifier to afford a state of an imaginary short, and a logarithmic conversion diode to which is applied, as an input, photo current generated in said photo diode, said measuring apparatus being driven in response to supplying electric power from a power source by operation of said power switch, the improvement comprising:

(a) a unidirectional semiconductor element having two terminals and which enables electric current to flow in one direction only between said two terminals, one of said two terminals of said semiconductor element being connected to a connection point of said logarithmic conversion diode and one of said input terminals of said operational amplifier;

(b) means for biasing the other terminal of said semiconductor element; and

(c) response means for causing said biasing means to start biasing in order to flow a current into said semiconductor element in response to said operation of said power switch.

4,462,671

CAMERA WARNING SHAKE SYSTEM

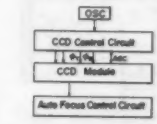
Kiziro Suzuki, Hamura, and Yoshiharu Takahashi, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

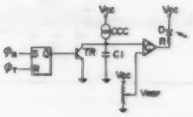
Filed Dec. 21, 1981, Ser. No. 333,053

Claims priority, application Japan, Dec. 24, 1980, 55-181828

Int. Cl.³ G03B 7/08

U.S. Cl. 354—430 **3 Claims**





1. In a camera having a taking lens and a charge-coupled device for achieving focus detection, a system for warning the operator of the camera of camera shakiness caused by shaking of the operator's hand holding the camera, comprising:

means for warning when the amount of electric charge stored in the charge-coupled device during a predetermined period of time fails to reach a predetermined amount of electric charge.

4,462,672

CONTROL CIRCUIT FOR AN ELECTROMAGNETICALLY DRIVEN PROGRAMMING SHUTTER

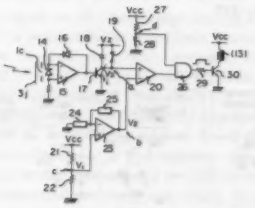
Tomio Kurosu, Iwatsuki, and Yukio Yoshikawa, Tokyo, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Feb. 24, 1983, Ser. No. 469,508

Claims priority, application Japan, Mar. 1, 1982, 57-32097; Mar. 1, 1982, 57-32098

Int. Cl.³ G03B 7/087, 7/097

U.S. Cl. 354—435 **13 Claims**



1. In a control circuit for an electromagnetically driven programming shutter having magnets and shutter blade driving coils provided on the respective shutter blades of said shutter and electromagnetically cooperating with said magnets, said shutter blades being actuated for opening and/or closing operation when said driving coils are energized, said control circuit having an electric source for energizing said driving coils, a scene light information detecting circuit including a photoelectric element adapted to receive the scene light in coupled relationship to the opening and closing operations

of said shutter blades so as to generate a scene light information indicating output voltage, a reference voltage generating circuit adapted to be energized by said electric source so as to generate a reference output voltage for obtaining a proper exposure of said shutter by comparing the same with said scene light information indicating output voltage, and a comparator adapted to receive said scene light information indicating output voltage and said reference output voltage and compare the former with the latter so as to generate a controlled proper exposure defining output pulse, said controlled proper exposure defining output pulse being supplied to said shutter blade driving coils so that said shutter is actuated for the proper exposure in cooperation with said magnets, the improvement wherein said reference voltage generating circuit comprises a voltage compensating circuit capable of varying said reference output voltage as a function of the variation in the voltage of said electric source thereby permitting said controlled proper exposure defining output pulse to be modified so as to compensate for the variation in the actuation of said shutter blades caused by the variation in the electromagnetic force generated by said shutter blade driving coils due to the variation in the voltage of said electric source.

4,462,673

SHUTTER TIME CONTROL CIRCUIT

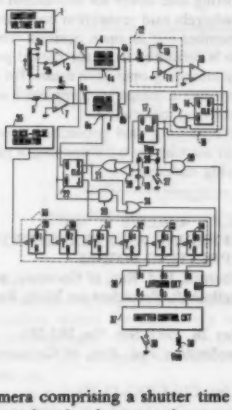
Masanori Uchidoi, and Nobuyuki Suzuki, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,701

Claims priority, application Japan, Aug. 3, 1981, 56-121573; Jun. 10, 1982, 57-99489

Int. Cl.³ G03B *7/093*

U.S. Cl. 354—458 **10 Claims**



1. A camera comprising a shutter time forming circuit for forming an analog signal representing a preset value of time, an A/D conversion circuit for converting said analog signal to an n-bit digital value, and a shutter time control circuit for controlling the shutter time in accordance with the most significant k-th bit to n-th bit of the said digital value, and further comprising:

superimposing means for superimposing a prescribed digital value of less than k bits ranging from 1st to (k − 1)th bit to said n-bit digital value.

4,462,674

COPYING APPARATUS OF MOVING DOCUMENT TYPE CAPABLE OF COPYING AN OPTICAL IMAGE PROJECTED FROM AN OPTION DEVICE

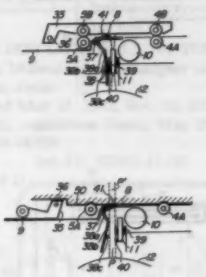
Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Mar. 31, 1981, Ser. No. 249,632

Claims priority, application Japan, Apr. 1, 1980, 55-41157

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **8 Claims**



1. In a copying apparatus having a fixed light source, a fixed elongated optical system defining a first optical path for making a slit exposure, means for moving and scanning a document, a photosensitive member arranged to receive an optical image formed by the optical system in synchronization with the scanning of the document, and an option device capable of being detachably mounted to the apparatus to copy an optical image projected from the option device, the improvement comprising an elongated second optical path spaced from and substantially parallel to said first optical path of the fixed elongated optical system of the copying apparatus, and an elongated shutter mechanism for opening and closing the second optical path, said shutter mechanism being opened when the option device is added to the copying apparatus for directly projecting on the photosensitive member through the second optical path an optical image formed by the option device.

4,462,675

PROCESS AND APPARATUS FOR THERMALLY FIXING TONER IMAGES

Roland Moraw, and Günther Schaedlich, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,150

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045485

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **8 Claims**

1. An apparatus for thermally fixing a latent electrostatic image which has been rendered visible by a liquid suspension developer, comprising:

a heater;

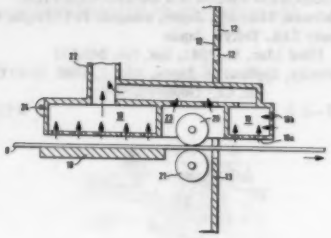
a support for said image;

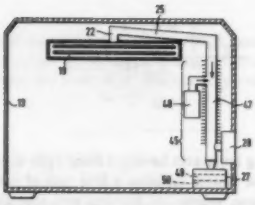
means for moving said support past said heater thereby vaporizing the developing liquid;

two vent systems arranged as an inner vent system disposed in the area of said heater and as an outer vent system disposed downstream of said heater in the discharge area of the copy support for sucking off said vaporized developing liquid in an air stream; and

means connected to said vent systems for condensing said vaporized liquid, including a spray device for spraying a

finely divided transport medium into said vaporized liquid and a condenser tube positioned downstream of said spray





device, and separating and collecting said condensed liquid.

4,462,676

SKEW CONTROL APPARATUS FOR ENDLESS-BELT-SHAPED RECORDING MATERIAL

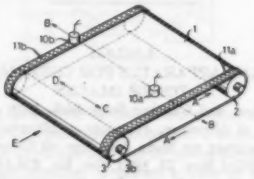
Akira Shimura, Kanagawa, and Yokota Takashi, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 29, 1982, Ser. No. 363,092

Claims priority, application Japan, Mar. 31, 1981, 56-46549

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—3 BE **7 Claims**



1. A skew control apparatus for use in a recording apparatus which performs recording on an endless-belt-shaped recording material which is supported and driven in rotation by a plurality rollers, comprising:

a skew detection means which detects the skewing of the endless-belt-shaped recording material and generates a skew detection signal when the recording material is skewed beyond a predetermined tolerance in the direction normal to the driven direction of the recording material;

a skewing direction reversing control means which reverses the skewing direction of the endless-belt-shaped recording material;

a timing signal generation circuit which generates a timing signal indicating when the recording apparatus is not in a recording operation period;

a control circuit which generates an output when the skew detection signal generated from the skew detection means and the timing signal generated from the timing signal generation circuit are input thereto at the same time; and

a drive switching means which switches the operation of the skewing direction reversing control means, depending upon the presence of the output from the control circuit.

4,462,677

IMAGE FORMATION APPARATUS USING A PROCESS UNIT WITH A PROTECTIVE COVER

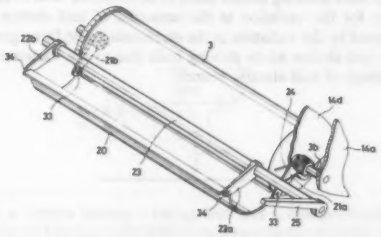
Shigeyoshi Onoda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1982, Ser. No. 381,684

Claims priority, application Japan, Jun. 22, 1981, 56-96407; Apr. 16, 1982, 57-64152

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **20 Claims**



1. An image forming apparatus for forming an image on an image receiving material, comprising:

a main assembly;

means forming a process unit, detachably mountable to said main assembly at a predetermined operating position thereof, for use in forming a said image on said receiving member, said process unit means including an image bearing member, processing means for acting on the image bearing member to form an image, a protection cover for protecting said image bearing member, and supporting means for supporting said cover for movement between a closed position wherein said protection cover covers said image bearing member and an open position wherein said protection cover is retracted from the closed position;

said main assembly including operative means for cooperating with said processing means to complete a said image on the image receiving material; and

actuating means for moving said protection cover to the closed position in association with opening a passage for the image receiving material.

4,462,678

DEVICE FOR FEEDING AND TRANSPORTING PRINTING FORMS

Günter Back, Diesenbergen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 382,288

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122321

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **11 Claims**

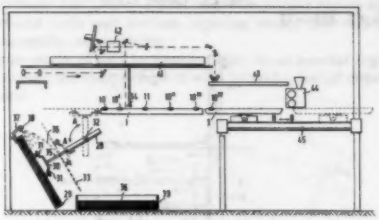
1. A device for feeding and transporting printing forms onto an exposure table, comprising:

a plurality of transport rollers located on each side of the exposure table for gripping the lateral edges of the printing forms, the transport rollers on each side being spaced apart in the direction of printing form transport to provide a first transport roller on each side and at least one subsequent transport roller on each side;

means for selectively pivoting said first transport rollers

outwardly from the edges of the printing form in response to feeding the leading edge of a printing form onto the exposure table, whereby jamming of the printing form against said first transport rollers is prevented;

two rail members, one movably positioned on each side of the exposure table and extending parallel to each other in the direction of printing form transport, wherein said transport rollers are mounted on said rail members; and



means, responsive to positioning of a printing form in an exposure position on the exposure table, for shifting said rail members outwardly in a direction perpendicular to the lateral edges of the printing form to move said transport rollers into positions spaced away from the lateral edges of the printing form, wherein said means for shifting said rail members comprises two lifting cylinders located beneath the exposure table and a rotary lever linkage system linking each cylinder to each of the rail members.

4,462,679

ELECTRONIC COPYING MACHINE

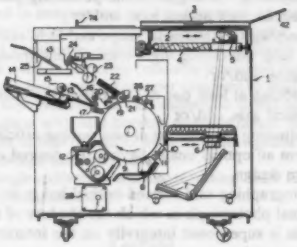
Keiji Itaya, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 25, 1982, Ser. No. 342,226

Claims priority, application Japan, Feb. 2, 1981, 56-13922

Int. Cl.³ G03G *15/02*

U.S. Cl. 355—14 CH **6 Claims**



1. An electronic copying machine having:

photosensitive means for selectively retaining an electrostatic latent image;

charger means for charging the surface of said photosensitive means;

exposure means for exposing said photosensitive means with an image from a document to form said electrostatic latent image of said document on said photosensitive means;

developing emans for applying a toner to said electrostatic latent image to form a toner image;

transfer charger means for transferring said toner image to a transfer medium;

discharge lamp means for exposing said surface of said photosensitive means to render said photosensitive means conductive so that charges on said surface are neutralized; and

control means for controlling a charging timing of said charger means and an exposure timing of said exposure means in such a manner that, even when making a first copy a leading end of a toner-image forming area of said photosensitive means, which corresponds to a leading end of the transfer medium, is first exposed to said transfer charger means and said discharge lamp means before being charged by said charger means in a polarity the same as said transfer charger means so that said leading end of said area can be exposed by said exposure means.

4,462,680

APPARATUS FOR CONTROLLING TONER DENSITY

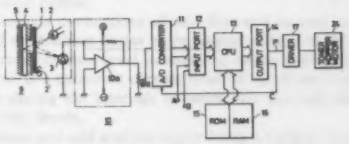
Yoshinori Ikeda, Matsudo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1982, Ser. No. 378,008

Claims priority, application Japan, May 20, 1981, 56-74987; May 20, 1981, 56-74988

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 D **21 Claims**



1. An apparatus for toner density control, comprising:

means for detecting the density of a supply of toner; and

means for forming a signal by which the amount of toner in the toner supply is controlled when the detected toner density differs from a reference value, said forming means forming the signal as a first signal when the difference is within a first range and forming the signal as a second signal when the difference is within a second range, wherein the rate of supply of toner varies in accordance with the detected density.

4,462,681

APPARATUS FOR PRODUCING DUPLEX COPIES FROM DUPLEX ORIGINALS

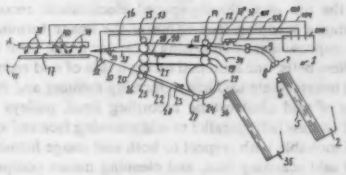
Wilhelmus J. Aerts, Venlo; Gerhardus E. R. ter Horst, Grubbenvorst, and Johannus L. J. M. Linssen, Baarlo, all of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Jul. 9, 1982, Ser. No. 396,817

Claims priority, application Netherlands, Jul. 14, 1981, 8103336

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **4 Claims**



1. A copying apparatus suitable for the production of duplex copies from duplex originals, comprising an original transport means with original transport paths including at least one feed path along which a duplex original is fed to an exposure station, a return path along which the duplex original is inverted and fed once again to the exposure station, and at least one discharge path along which the duplex original is transported from the exposure station to a storage station from which it can be fed once again to the exposure station; means for recording

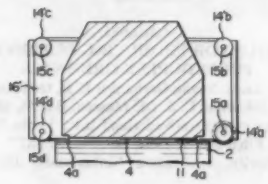
the information present on the original onto a recording medium; transfer means for transferring the information from the recording medium onto a sheet of receiving material; means for inverting the sheet of receiving material and feeding it once again to the transfer means to form a duplex copy; and means for discharging a duplex copy to a collector tray, wherein: the original transport paths are operable to invert a duplex original an odd number of times during each transport along said paths; said means for discharging a duplex copy to the collector tray comprises two transport paths, one of which is operable to deposit a duplex copy into said collector tray with the side first printed facing downwards, and the second is operable to deposit a duplex copy in said collector tray with the side last printed facing downwards; and control means are provided for controlling the transportation of duplex copies, the duplex copies produced from the same duplex original being discharged alternately via the one or the other transport path.

4,462,682

ELECTROSTATIC RECORDING APPARATUS

Masao Monma, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 24, 1981, Ser. No. 237,602
Claims priority, application Japan, Feb. 27, 1980, 55-24255
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **4 Claims**



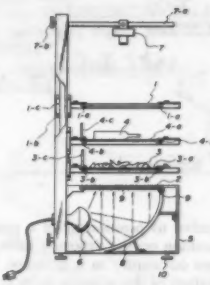
1. In an electrostatic recording apparatus of the type in which a latent image is formed on an image forming member by the use of a closely spaced electrostatic recording head having a scanning face opposite the image forming member, the improvement comprising a carrier in the form of a pair of endless belts, one mounted on each side of said recording head and intermediate said image forming member and the scanning face of said electrostatic recording head, pulleys supporting said endless belts parallel to said scanning face and spaced from and movable with respect to both said image forming member and said scanning face, and cleaning means comprising compressible material of a thickness normally greater than the space between the scanning face of said electrostatic recording head and said image forming member, mounted on and between said pair of endless belts and in contact with said scanning face, whereby rubbing contact of said compressible material with said scanning face is assured and undesirable material accumulating on said scanning face is wiped off by said compressible material, and in which the edge of the scanning face of said electrostatic recording head is formed with cut-out sections adapted to receive said cleaning means.

4,462,683

METHOD OF PREPARATION OF PATTERN DESIGNS FOR PRINTING

Kohtaroh Hiraba, 4-4-3, Nihonbashi Naniwa-ku, Ohsaka-shi, Ohsaka-Fu, Japan

Continuation of Ser. No. 219,920, Dec. 24, 1980, abandoned.
This application Sep. 29, 1982, Ser. No. 427,459
Claims priority, application Japan, Nov. 5, 1980, 55-154708
Int. Cl.³ G03B *27/32*
U.S. Cl. 355—77 **6 Claims**



1. A method for the preparation of colored pattern designs for printing which comprises the steps of

(a) mounting two confronting polarizing plates about an optical axis at a spaced distance apart,

(b) interposing a light-transmitting interfering transparent substance between said two confronting polarizing plates,

(c) interposing an opaque article having a specific shape and structure between one of said two polarizing plates and said transparent substance,

(d) projecting light beams through the assembly formed by steps (a), (b) and (c) to there establish a colored pattern design,

(e) varying said colored pattern design by

(1) adjusting the angles of the polarizing plates with respect to their optical axis, and/or

(2) varying the thickness, shape and light-refracting state of said interfering light-transmitting transparent substance, and/or

(3) moving at least one of said polarizing plates about the optical axis, and/or

(4) adjusting the position of said opaque article to thereby form an optical image having the desired colored pattern design,

(f) photographing said formed optical image to produce an original photograph in which the shadow of said opaque article is superposed integrally on the interference color pattern, and

(g) forming a pattern design based on said photograph.

4,462,684

SINGLE WHEEL CELESTIAL NAVIGATOR

William L. Abler, 3350 S. Michigan, Chicago, Ill. 60616

Filed Oct. 9, 1981, Ser. No. 310,071
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.³ G01C *1/00, 1/14*
U.S. Cl. 356—146 **10 Claims**

1. A celestial navigation and position locating instrument comprising in operative combination:

(a) a sky assembly having means for simultaneous sighting of two celestial objects and superimposing the images thereof centered on crosshairs in a single field of view, at least one of which celestial objects is viewed by direct sighting;

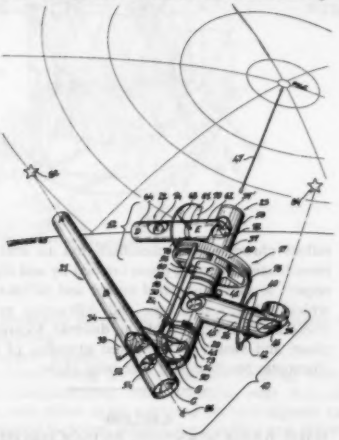
(i) positions of said celestial objects sighting means being adjustable with respect to each other; and

(ii) the positions of said celestial objects sighting means being settable for SHA and PD for preselected celestial objects; and

(b) a horizon assembly movably secured to said sky assembly and having means for sighting a horizon,

(i) the position of said horizon sighting means being adjustable with respect to said sky assembly so that local latitude and LHAγ are locatable on setting means associated with said horizon sighting means and said sky assembly, respectively,

(ii) an image of said horizon is visible in an annular region around the central field of view of said celestial objects, and



(iii) said horizon sighting means being adjustable so that a horizon line thereof can be set to coincide with the local horizon;

(c) said horizon assembly having a single calibrated wheel mounted in conjunction with said horizon sighting means calibrated in 360° for reading SHA therefrom;

(d) said sky assembly comprising a sky telescope assembly and a sky elbow assembly rotatably journaled thereto, said sky elbow having a first vernier disposed to read the SHA of said sky telescope on said calibrated wheel mounted in conjunction with said horizon sighting means for reading the SHA of one of said celestial objects sighted with said sky telescope assembly; and

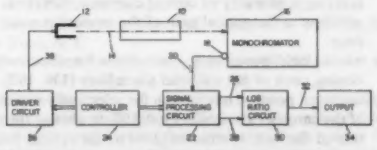
(e) said single calibrated wheel permitting SHA readings of both celestial objects.

4,462,685

SPECTROANALYTICAL SYSTEM

Stanley B. Smith, Jr., Westford, Mass., and Gary M. Hieftje, Bloomington, Ind., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Filed Mar. 4, 1981, Ser. No. 240,542
Int. Cl.³ G01N *21/31*
U.S. Cl. 356—307 **11 Claims**



1. A spectroanalytical system comprising a radiation source that emits spectral line radiation characteristic of an element to be analyzed,

an analysis region open to passage of the beam of radiation from the source and in which a sample of the substance to be analyzed is atomized,

source control means including an electronic switch for controlling current flow to said radiation source,

first current level establishing means, second current level establishing means, quiescent current level establishing means, and means for alternately connecting said first and second current level establishing means in circuit with said electronic switch to energize said source at a first intensity level when said first current level energizing means is connected to said electronic switch to provide a first narrow spectral line radiation output that has a spectral line peak at a wavelength of an element to be detected, and to energize said source at a second higher intensity level when said second current level establishing means is connected to said electronic switch to provide a second radiation output of broader wavelength with partial suppression of intensity at the center wavelength of said first radiation output,

said alternate connections of said first and second current level establishing means being spaced in time so that said quiescent current level establishing means energizes said source at a quiescent current level of about one milliampere during the intervals between said first and second intensity levels,

said source and said analysis region being arranged such that radiation from said source is passed directly from said source into said analysis region without further central wavelength intensity suppression,

electronic transducing means for developing an electrical signal corresponding to the sensed radiation intensity of the radiation beam from said source that passes through said analysis region, and

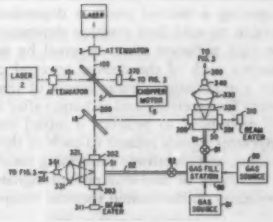
means for utilizing the relative values of said electrical signals corresponding to said first and second radiation outputs to provide concentration information on said element in the sample analyzed.

4,462,686

LASER ISOTOPE DETECTION AND MEASUREMENT

Thomas J. Bridges, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 9, 1981, Ser. No. 252,407
Int. Cl.³ G01N *21/64*
U.S. Cl. 356—318 **12 Claims**



1. Apparatus for determining the ratio of concentrations of first and second isotopes of a specific material in a test sample which comprises:

a standard sample containing a known ratio of concentrations of either said first and second isotopes or a compound containing said first and second isotopes of said specific material;

a first source of laser radiation which utilizes a laser material comprising said first isotope or said compound of said first isotope;

a second source of laser radiation which utilizes a laser material comprising said second isotope or said compound of said second isotope;

means for alternatively exposing said test and said standard samples to said laser radiation from said first and said second sources, a portion of which radiation is absorbed in said test and said standard samples; and

means for detecting the portion of said absorbed radiation and comparing the amounts absorbed from said first source and said second source, whereby said ratio is determined.

4,462,687

APPARATUS FOR SPECTRAL ANALYSIS OF A BROAD BEAM OF RADIATION USING A DISPERSIVE ELEMENT INTERPOSED BETWEEN TWO MODULATORS

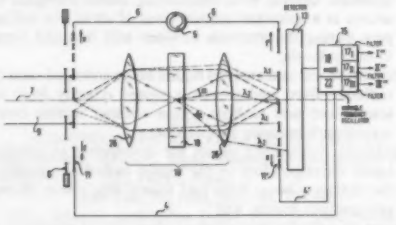
Gerhard Krause, Rosenheim, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,773

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045156

Int. Cl.³ G01J *3/12*

U.S. Cl. 356—326 **14 Claims**



1. An apparatus for spectral analysis of a broad beam of radiation having a plurality of spectral components, the apparatus comprising dispersion means having a direction of selection for subjecting each of said spectral components to a frequency dependent dispersal in said direction of selection; a first modulator having a first modulation structure, means for moving said first modulation structure parallel to said direction of selection for imposing a first position dependent modulation function on said broad beam of radiation before said beam of radiation falls on said dispersion means; a second modulator having a second modulation structure, means for moving said second modulation structure parallel to said direction of selection for imposing a second position dependent modulation function related to said first position dependent modulation function on said radiation after dispersal by said dispersion means, whereby each of the desired spectral components is subjected to a modulation characteristic of that component, detector means for receiving said radiation after modulation by said second modulator to produce a mixed electrical signal having component signals related to each of the desired spectral components, and electronic processing means for separating out at least one of said component signals whereby to obtain information on the related spectral component.

4,462,688

SPECTRALLY TAILORED WAFER CHUCK SHAPED LIGHT METER

Nathan Gold, 13126 Anza Dr., Saratoga, Calif. 95070

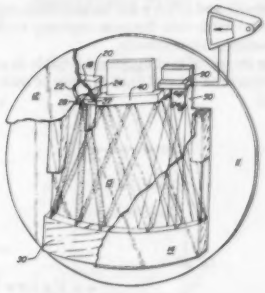
Filed Nov. 16, 1981, Ser. No. 321,657

Int. Cl.³ G01J *3/18*

U.S. Cl. 356—328 **8 Claims**

1. A light meter comprising in combination:

a modified monochromator having a light entrance slit, a cylindrical mirror, a diffraction grating and a focussing plane, each disposed between parallel and confronting mirrors; said light entrance slit disposed with respect to said cylindrical mirror to allow diverging light to pass between said slit and said cylindrical mirror and to have rebounding therefrom substantially collimated light rays; said diffraction grating disposed with respect to said cylindrical mirror and entrance slit to receive substantially collimated light rays from said cylindrical mirror and to



reflect chromatically classified rays to said cylindrical mirror; said focussing plane created by and disposed with respect to said cylindrical mirror and diffraction grating, which cylindrical mirror and diffraction grating focus discrete chromatic bands at discrete locations on said plane; and means for weighted summing of the discrete chromatic bands at said focussing plane.

4,462,689

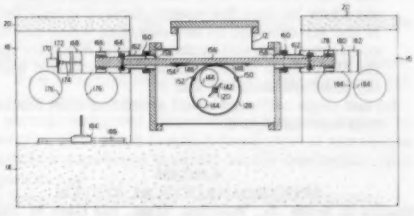
WIDE BAND SCANNING MONOCHROMATOR

Milton N. Kabler, Alexandria; Richard T. Williams, Fairfax, both of Va.; Jack C. Rife, Washington, D.C.; William R. Hunter; Johnny P. Kirkland, both of Springfield, Va., and Neil C. Lien, Evansville, Wis., assignors to Baker Manufacturing Company, Evansville, Wis.

Filed Jul. 9, 1982, Ser. No. 398,090

Int. Cl.³ G01J *3/18*

U.S. Cl. 356—333 **14 Claims**



1. A scanning monochromator capable of operating in an ultra-high vacuum under external control, the monochromator comprising:

a pair of optical element carousel assemblies (**100, 102**) each carrying a plurality of optical elements (**106**) only one of which is in the optical path of the monochromator at any time;

a translational positioning mechanism for selectively positioning each of the carousel assemblies (**100, 102**);

a rotational position mechanism for selectively rotating each of the carousel assemblies (**100, 102**) to change the orientation of the optical element (**106**) in the optical path; and

a carousel rotating mechanism for rotating each of the carousel assemblies (**100, 102**) to change the one of the optical

elements (106) of each carousel assembly (100, 102) which is in the optical path of the monochromator.

4,462,690

APPARATUS FOR THE PRODUCTION OF APPLICABLE COATING MATERIAL FOR COATING MILLED-OFF OR PEELED-OFF ROAD SURFACES

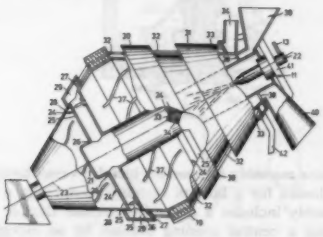
Reinhard Wirtgen, Hohner Strasse 2, D-5461 Windhagen/Linz, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,505

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106347

Int. Cl.³ B28C 5/42, 5/46

U.S. Cl. 366—25 7 Claims



1. In an apparatus for producing material for coating road surfaces, including

mobile support means,

a mixer drum having an inner surface defining a mixing space communicating with material inlet and outlet means, said mixer drum mounted on said support means and adapted to rotate about a longitudinal axis thereof,

means for rotating said mixer drum about its longitudinal axis,

means disposed on an inner surface of said mixer drum for mixing the material when said mixer drum rotates in one direction, and for conveying the material to facilitate the discharge of the material from said mixer drum when said mixer drum rotates in an opposite direction, and

means situated within said mixer drum for heating the material charged into said mixer drum through said inlet means, said heating means including combustion means,

the improvement comprising:

said combustion means including a combustion tube mounted so as to enter into the mixing space of said mixer drum, and

at least one elongate support having one end connected to said combustion tube and extending substantially radially therefrom,

the other end of said elongate support being connected to the inner surface of said mixer drum,

said elongate support constituted of thermally-conductive material,

whereby the material charged into the mixing spaces passes over said at least one support, to be heated by said at least one support.

4,462,691

MIXER/EXTRUDER HAVING SELECTIVELY VARIABLE SHEARING ACTION THEREIN

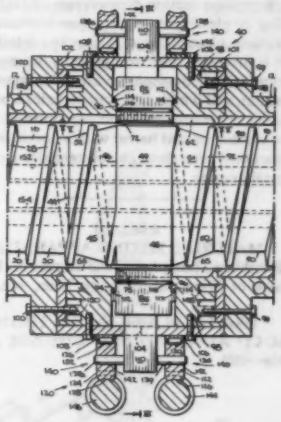
Jan J. Boguslawski, New York, N.Y., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jan. 13, 1983, Ser. No. 457,793

Int. Cl.³ B29B 1/06

U.S. Cl. 366—80 10 Claims

10. An extruder, including an elongated rotor and a cylindrical barrel surrounding said rotor, said extruder having a feed zone, a metering zone and at least one mixing or working zone positioned between said feed zone and said metering zone; the rotor in said mixing or working zone including an upstream groove-forming flighted portion, a downstream groove-forming flighted portion and a substantially unflighted portion intermediate said upstream and downstream flighted portions; the barrel in said mixing or working zone including on an inner surface thereof upstream input grooves open to and at least in part overlaying the grooves in said upstream flighted portion of said rotor and downstream output grooves open to and at least in part overlaying the grooves in said downstream flighted portion of said rotor, said input grooves and output grooves of said barrel each including portions thereof which overlay said substantially unflighted portion of said rotor, the portions of said input and output grooves of the barrel which overlay the substantially unflighted portion of the rotor being circumferentially spaced from and interleaved with one another; cahnnel means intercommunicating said input and output grooves, said channel means comprising a plurality of circumferentially oriented passageways which overlay and face the substantially unflighted portion of the rotor and interconnect the interleaved, circumferentially spaced portions of corresponding input and output grooves of said barrel; throttling means positioned in said channel means for varying the cross-sectional area of said channel means to thereby vary the amount of shearing action and work performed on material passing through such channel means, said throttling means comprising a plurality of radially movable wedge members, there being one of said wedge members positioned in each of said passageways; camming means carried by said barrel for concurrently moving said wedge members to selected corresponding positions between their radially innermost positions and their radially outermost positions, said camming means including at least one camming ring rotatably positioned on said barrel, said camming ring including a plurality of camming slots therein, there being one of said camming slots for each of said wedge members, said camming ring further including gear tooth means fixedly positioned thereon, said wedge members each including a cam follower fixed thereto, said cam followers being in engagement with corresponding ones of said camming slots; and drive means including a worm gear in engagement with the gear tooth means on said camming ring for rotating said camming ring to thereby concurrently radially move said wedge members.

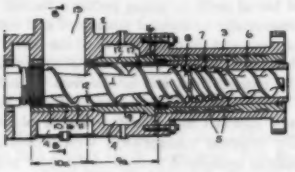


4,462,692

SCREW EXTRUDERS

Paul Meyer, Wiesbaden, Fed. Rep. of Germany, assignor to Frenkel C-D Aktiengesellschaft, Vaduz, Liechtenstein

Filed May 2, 1983, Ser. No. 490,647
Claims priority, application United Kingdom, Nov. 27, 1982, 8233890
Int. Cl.³ B29B 1/06
U.S. Cl. 366—89 21 Claims



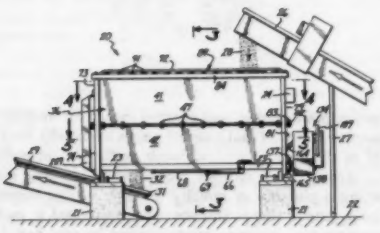
1. An extrusion apparatus having a barrel and a rotatable threaded screw coaxially positioned within said barrel, said apparatus including an upstream inlet section having an opening therein for receiving material to be processed by the apparatus, a compression section downstream of said inlet section, and a mixing or plasticizing section downstream of said compression section, characterized in that the interior surface of said barrel is provided with an undercut therein which intercommunicates said feed opening with said compression section of said extruder, and which undercut includes a portion thereof which extends downstream in said compression section about the interior surface of said barrel with a continuously decreasing cross-sectional area through substantially a complete 360° turn about said screw.

4,462,693

MATERIAL MIXING APPARATUS

Floyd E. Buschbom, Long Lake, and Donald L. Henke, Maple Plain, both of Minn., assignors to Veda, Inc., Long Lake, Minn.

Filed Jan. 25, 1980, Ser. No. 115,184
Int. Cl.³ A23N 17/00; B01F 7/00, 7/08, 15/02
U.S. Cl. 366—189 67 Claims



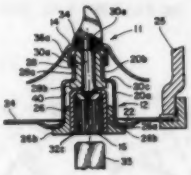
1. An apparatus for mixing material comprising: first box means having a chamber for accommodating material, second means located in said chamber for mixing (the) material located in the chamber, means movably mounting the second means on the box means, power means for moving the second means in a manner to mix material in the chamber, releasable drive means drivably connecting the power means with the second means, and means mounting the power means on the (first) box means for movement of the power means to a first position wherein the releasable means drivably connects the power means with the second means and for movement from the first position to a second position wherein the releasable means separates the power means from the second means to disconnect the drive between the power means and second means.

4,462,694

AGITATOR ASSEMBLY FOR USE IN BLENDER APPLIANCE

Peter J. Ernster, Glendale, and Henry Jacyno, Franklin, both of Wis., assignors to Sunbeam Corporation, Oak Brook, Ill.

Filed Aug. 23, 1983, Ser. No. 525,641
Int. Cl.³ B01F 7/16
U.S. Cl. 366—205 10 Claims



8. An agitator assembly for use in a blender vessel having a detachable closure for a bottom opening comprising a diaphragm assembly includes a generally circular flexible diaphragm having a central opening defined by an elongated stepped flange, said flange having a lower first and an upper second portion, said first portion being of greater diameter than said second portion, a pair of shouldered bearings mounted coaxially in said flange with a first bearing being partially received in said first portion and a second smaller diameter bearing being received in said second portion, a two-piece shaft assembly supported for rotation by said bearings, said shaft assembly including a cylindrical socket and a blade shaft, said socket having a passageway extending axially therethrough, said passageway having an enlarged diameter portion extending from one end to a plane adjacent the other end where it connects with a reduced diameter portion which extends through to the other end, said socket being journaled in said first bearing, said shaft being elongated with a central portion journaled in said second bearing, an enlarged portion of noncircular cross-section at one end of said shaft being sized to slide axially into said enlarged diameter portion of said passageway and engage the walls thereof to lock said socket and said shaft against relative rotation, a blade assembly, said blade shaft having an-end remote from said enlarged portion to which said blade assembly is secured adjacent the upper end of said second bearing, said socket and said blade assembly retaining said shaft assembly in assembled relation to said diaphragm assembly.

4,462,695

COMPOSTING APPARATUS

Kanichi Ito; Yoshio Hirayama, and Ryoichi Takeuchi, all of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 379,996, May 19, 1982, abandoned. This application Aug. 19, 1983, Ser. No. 524,693
Claims priority, application Japan, May 22, 1981, 56-77806
Int. Cl.³ B02C 21/02; A01C 3/06
U.S. Cl. 366—345 2 Claims

1. A composting method for processing waste material on a large scale, said method comprising the steps of:

preparing a composting apparatus which comprises:

a first reversible conveyor to which material to be composted is supplied from a stationary material feeder;

a conveyor support on which said first conveyor is mounted, said conveyor support being adapted to move back and forth in the same direction as the extending direction of said first conveyor;

elongated bridges operatively connected to said conveyor

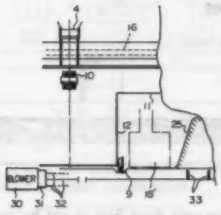
support at opposite end portions thereof, each said bridge extending at a right angle relative to said conveyor support;

an elongated carriage disposed on each of said bridges so as to be reversibly movable on said bridge along the length thereof;

a reversible rotary paddle suspended from each of the opposite end portions of said carriages; and

a second reversible conveyor mounted on each of said carriages and adapted to receive material from said first conveyor, whereby zig-zag movement of said paddles is made possible;

arranging a series of distinct composting sections in a row along the moving direction of said conveyor support at each of the opposite sides of said conveyor support;



supplying material to one of said composting sections by simultaneously rotating and moving said paddle in zig-zag fashion by the combined movement of said support and said carriages so that a uniformly heaped layer of the material is formed in said one section;

agitating simultaneously heaped layers of the material at four sections when material feeding is not being performed and agitating simultaneously three sections when material feeding is being performed to one of said sections;

removing the compost from one of the sections wherein the composting operation is completed; and

repeating the above operation by shifting said support according to a predetermined schedule.

4,462,696

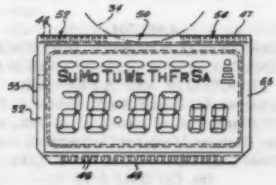
ELECTRONIC WATCHES

Tak-Yim Yung, and David Citrin, both of Hong Kong, Hong Kong, assignors to United Agencies Limited, Hong Kong

Continuation of Ser. No. 213,809, Dec. 8, 1980, abandoned. This application Jul. 20, 1983, Ser. No. 515,882

Int. Cl.³ G04C *19/00*

U.S. Cl. 368—84 **8 Claims**



1. An electronic watch comprising:

an outer casing,

a glass front for said casing,

a substantially rectangular liquid crystal display visible through said glass front and having an opposed pair of longer edges and an opposed pair of shorter edges,

electrical contacts positioned on the rear face of said display, adjacent one of said longer edges for the entire length thereof and adjacent the other of said longer edges for portions of the length thereof towards each end thereof, leaving a contact-free region along a central portion of said other longer edge,

a circuit board positioned behind said display,

means for connecting said contacts of said display to said circuit board,

a crystal oscillator for providing a constant frequency oscillating signal,

an integrated circuit chip for controlling the operation of said display and other watch functions and receiving said constant frequency oscillating signal from said crystal oscillator,

a thin circular battery for powering said watch, said battery positioned behind and parallel to said display and adjacent to said circuit board, the region of overlap between said battery and said display lying entirely within said contact-free region on said rear display face,

a piezo-electric crystal,

a substrate to which said crystal is bonded,

means for applying an oscillating electrical signal across said crystal, and

means mechanically linking said glass front to said crystal to provide an audible alarm when said signal is applied to said crystal.

4,462,697

INTEGRAL PLASTIC STRAP AND BEZEL FOR A WRISTWATCH

Harwell B. Thompson, Cheshire, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 4, 1982, Ser. No. 354,827

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—282 **7 Claims**

1. In a wristwatch of the type having a bell-shaped crystal molded of transparent material with a central viewing portion and a depending peripheral wall portion terminating in a lower end, said wall portion having an integral pendant formed therein, and having a snap-fit caseback adapted to be separably attached to the lower end of said depending wall portion to form a water-resistant enclosure for the wrist-watch, the improvement comprising:

an integral strap and bezel molded of plastic material and having a bezel interposed between and joined to opposite strap portions, whereby the strap portions blend into and become an integral part of the bezel,

said bezel having a peripheral wall surrounding said depending wall portion of said crystal, and having a peripheral ledge defining a central opening surrounding said crystal viewing portion, said bezel peripheral wall being arranged so as not to obstruct removal of the snap-fit caseback from the lower end of said crystal depending peripheral wall portion, and

means comprising a plurality of integral protrusions extending on opposite diametral sides of the crystal away from

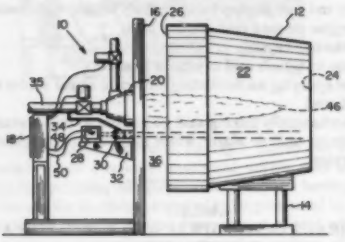
the crystal depending wall portion, said protrusions cooperating with the bezel and adapted to retain the crystal within the bezel.

4,462,698

NONCONTACT TEMPERATURE SENSING METHOD AND APPARATUS FOR LADLE PREHEATING

Robert T. Ely, Pittsburgh, Pa., assignor to Bloom Engineering Company, Inc., Pittsburgh, Pa.

Filed Apr. 21, 1982, Ser. No. 370,366
Int. Cl.³ G01J 5/08
U.S. Cl. 374—125 **9 Claims**



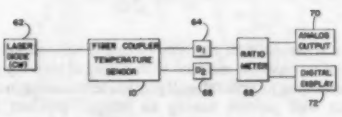
1. In a ladle heating apparatus in which a ladle and a wall are juxtapositioned so that burner means associated with the wall fire through a ladle opening and into an interior thereof for preheating purposes, the improvement comprising a sight tube extending through said wall, a noncontact radiation pyrometer mounted to the wall for sighting through said sight tube and measuring the radiation of a ladle interior surface and adjustment means connecting the radiation pyrometer to the wall to permit adjustment of the pyrometer to sight on the ladle bottom.

4,462,699

FIBER COUPLER TEMPERATURE TRANSDUCER

Herbert J. Shaw, Stanford, and Michel J. F. Digonnet, Menlo Park, both of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Sep. 10, 1981, Ser. No. 300,954
Int. Cl.³ G01J 5/08; G02B 5/172
U.S. Cl. 374—131 **20 Claims**



1. A method of measuring temperature, comprising:

removing a portion of the cladding from the side of each of first and second single mode optical fibers to provide a coupling surface on each fiber;

mounting said first and second optical fibers to form an evanescent fiber optic coupler by positioning said first and second fibers side-by-side and juxtaposing said coupling surfaces;

selecting a temperature responsive material having an index of refraction which changes relative to the claddings of said fibers in response to temperature changes over the range of temperatures for which measurement of temperature is desired, to provide a coupling between said first and second fibers, said coupling changing with temperature said fibers being single mode throughout said range of temperatures;

interposing said temperature responsive material between said coupling surfaces of said optical fibers; and

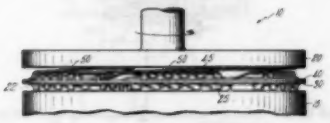
measuring the coupling efficiency of said evanescent fiber optic coupler to determine said temperature.

4,462,700

HYDRODYNAMIC FLUID FILM THRUST BEARING

Giridhari L. Agrawal, Simsbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1981, Ser. No. 324,220
Int. Cl.³ F16C 32/06
U.S. Cl. 384—105 **5 Claims**



1. A hydrodynamic fluid film thrust bearing comprising a stationary thrust plate, a rotatable thrust runner defining with said thrust plate, a spacing therebetween, plural smooth foil elements disposed within said spacing and angularly displaced about said thrust runner, said thrust runner being supported on a pressurized fluid film layer maintained by relative movement between said thrust runner and said foil element, said fluid film thrust bearing further comprising at least one first resilient backing member disposed within said spacing and accommodating by elastic deformation thereof, excursions of said rotating member due to loading and imbalances thereof, said bearing being characterized by:

at least one second resilient backing member having a stiffness greater than that of said first resilient backing member and uncoupled therefrom, said second resilient backing member being disposed between said first resilient backing member and said thrust runner for resisting deflections of said foil element, thereby maintaining an optimum geometry of said fluid film layer under operating conditions.

4,462,701

PRINTING SYSTEM WHEREIN JUSTIFICATION DETERMINATION IS SHARED BETWEEN A HOST PROCESSOR AND A PRINTER

Joseph S. Czyszczewski, Round Rock; Robert A. Pascoe, and James M. Stafford, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 11, 1982, Ser. No. 377,101
Int. Cl.³ B41J 5/30
U.S. Cl. 400—3 **8 Claims**

1. In a system comprising a printer controlled by a host processor, the improvement comprising,

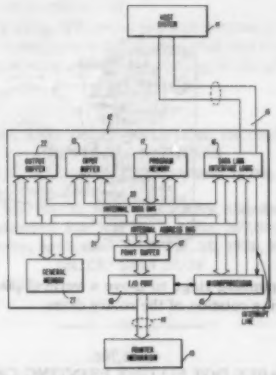
justification means in said processor for sequentially processing a data stream including,

means for determining if a next unit in said data stream is a space unit,

means for storing a list predetermining which space units are alterable, and

means for determining from said list whether said next space unit is alterable,

means for conveying to said printer data indicating which space units are to be altered, and



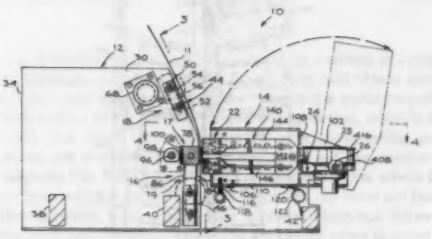
means in said printer for determining the size of said alterable space units to effect justification.

4,462,702

DOT MATRIX LINE PRINTER

William O. Fritz, Anaheim; John C. Chamberlain, Irvine, and Gary C. Chandler, Laguna Beach, all of Calif., assignors to Trilog, Inc., Irvine, Calif.

Filed Jun. 7, 1982, Ser. No. 386,199
Int. Cl.³ B41J 3/12
U.S. Cl. 400—58 **7 Claims**



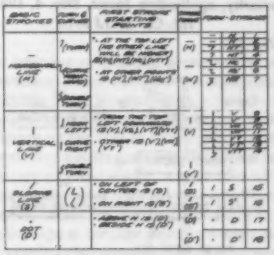
1. A dot matrix line printer comprising:
a main frame;
a paper drive subassembly mounted on said main frame including means for engaging a paper web for stepping said web along a paper path extending in the direction of the elongation of said web;
a platen subassembly mounted on said main frame including a platen having a flat flat front face extending along a portion of said paper path
and across substantially the entire width of said paper web adjacent a rear surface thereof;
a shuttle frame;
a first hammer bank subassembly including a plurality of dot hammer elements mounted in alignment to define a print row, each hammer element mounted for substantially linear movement toward and away from said platen front face said shuttle frame including means mounting said first hammer bank subassembly for reciprocal linear movement along said print row in a direction extending parallel to the width of said paper web;
means mounting said shuttle frame relative to said main frame for pivotal movement about an axis extending parallel to the width of said paper web between an operating position with said print row extending parallel to said platen front face adjacent the front surface of said paper web and an open position affording access to said hammer elements and the paper path between said hammer elements and said platen;
said platen subassembly further including platen mounting means comprising at least one pair of first and second spaced parallel leaf springs, each of said leaf springs having a first end anchored and a second end attached to said platen for allowing substantially linear movement of said platen front face toward and away from said print row while maintaining said front face perpendicular to the direction of hammer element movement; and
cam means bearing against said platen to position said platen front face a selected distance from said hammer elements.

4,462,703

APPARATUS AND METHOD FOR CONTROLLING AND ORDERING CHINESE CHARACTERS

Hsing C. Lee, 219 W. 106th St., New York, N.Y. 10025

Continuation-in-part of Ser. No. 95,620, Nov. 19, 1979, abandoned. This application Dec. 22, 1981, Ser. No. 333,336
Int. Cl.³ B41J 3/06
U.S. Cl. 400—110 **4 Claims**



1. Apparatus for producing electrical signals corresponding to Chinese characters, said Chinese characters being formed of one or more form-strokes with each individual form-stroke being represented by a unique form-stroke identification element, said apparatus comprising:
first memory means for storing information pertaining to a plurality of individual first form-stroke identification elements corresponding to horizontal line, vertical line, sloping line and dot form-strokes respectively corresponding twin form-stroke identification elements, and respectively corresponding subsequent form-stroke identification elements, corresponding ones of the first form-strokes, said twin form-strokes and said subsequent form-strokes having a predetermined relationship with respect to relative dimension and location within a predetermined character zone, whereby said first horizontal line form-strokes begin at the upper left portion of said predetermined character zone and are higher than said horizontal line twin form-strokes, said first vertical line form strokes extending vertically for a distance greater than one-half of a height dimension of said predetermined character zone, while said vertical line twin form-strokes extend vertically for a distance shorter than one-half of said height dimension, said first sloping line form-strokes extending slopingly downwardly in said predetermined character zone, said first dot form-strokes being selectively arranged above, below and beside said first horizontal and said horizontal twin form-strokes and said respectively corresponding subsequent form-stroke identification elements selectively appearing in a different location within said predetermined character zone than said first form-stroke identification elements;

serial storage means for combining selected ones of said individual form-stroke identification elements, twin form-stroke identification elements and subsequent form-stroke identification elements which correspond to a selected Chinese character into a form-stroke address, said serial storage means including means for generating a unique form-stroke address dependent upon an entry sequence for said form-stroke identification elements, said corresponding twin form-stroke identification elements and said corresponding subsequent form-stroke identification elements, and

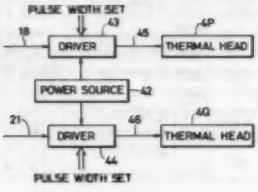
second memory means responsive to said form-stroke address for producing a signal corresponding to said selected Chinese character, said signal corresponding to information stored in a memory location identified by said form-stroke address, there being included within said second memory means a large number of memory locations containing information pertaining to a corresponding number of respective Chinese characters.

4,462,704

THERMAL HEAT DRIVING SYSTEM

Masami Kurata, and Toshiharu Inui, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,308
Claims priority, application Japan, Dec. 4, 1981, 56-194439
Int. Cl.³ B41J 3/02
U.S. Cl. 400—120 **4 Claims**



1. A thermal head driving system comprising: at least first and second thermal heads, an electric power source used to drive said heads at the same voltage, means disposed between said power source and each of said heads for producing first and second driving pulses for said first and second heads respectively each of said pulses having widths determined such that the ratio of pulse widths is directly proportional to the ratio of resistance values of each of said thermal heads, wherein said first and second thermal heads are driven by said respective first and second driving pulses to effect thermal recording.

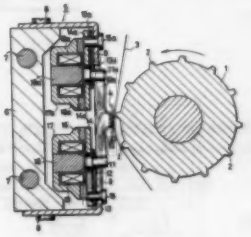
4,462,705

CROSS HAMMER DOT PRINTER

Mikio Hayashi, and Seiki Mizutani, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,839
Claims priority, application Japan, Jun. 30, 1981, 56-102987
Int. Cl.³ B41J 3/02
U.S. Cl. 400—121 **14 Claims**

1. A cross hammer dot printer comprising: a print head carrying thereon two or more electromagnetically driven print hammers and being displaceable lengthwise with respect to a cylindrical rotary drum disposed in spaced relation therefrom, said rotary drum being provided on the outer periphery thereof with a plurality of ridges extending parallel to the axis of rotation thereof, each of said ridges being positionable so as to intersect said print hammers during rotation of the rotary drum to enable the printing of a dot matrix, means mounting said print hammers parallel to and spaced from one another at a distance corresponding to a multiple of a horizontal pitch of the dot matrix, and means for changeably driving said print hammers at intervals corresponding to the time required for



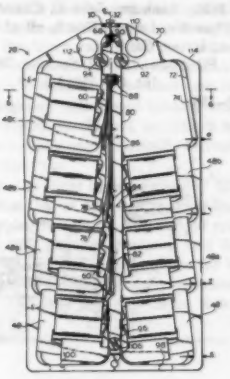
the corresponding ridge to move a vertical pitch of the dot matrix during rotation of the rotary drum.

4,462,706

STACKABLE DOT MATRIX PRINTING CARTRIDGE MODULES

Arthur L. Matschke, Southport, Conn., assignor to Baudex Corp., Westport, Conn.

Filed Apr. 22, 1982, Ser. No. 370,803
Int. Cl.³ B41J 3/12
U.S. Cl. 400—124 **22 Claims**



1. A stackable dot matrix printing cartridge module comprising:

a cartridge body, said body comprising a thin, flat, open-sided frame of generally rectangular shape and including on the inner, long sides of said frame a plurality of electromagnet print-cell mounting surfaces at a small, acute angle to the center-line axis of said body, and on one short side a nose bearing for retaining a plurality of print-cell priming wires in a contiguous linear array;

said linear array being formed in part by said print-cell mounting surfaces being successively offset by one wire diameter;

a plurality of electromagnetic print-cells mounted on said mounting surfaces, each said cell having an armature located near the center-line axis of said body at said small, acute angle thereto, said armature being moveable in a printing stroke plane;

a plurality of print wires attached to the forward end of each said armature and coaxial therewith, each said print wire being of a length to extend from its armature into and through said nose bearing and forming collectively said contiguous linear array;

said mounting surfaces being positioned so that each said armature and print wire in said linear array moves upon actuation of a cell without angular deviation from said printing stroke plane; and

guide means along said center-line axis adapted to retain and guide each said print wire between each said armature and said nose bearing within said printing stroke planes.

4,462,707

PRINTING AND/OR CORRECTING DEVICE FOR PRINTING MACHINES

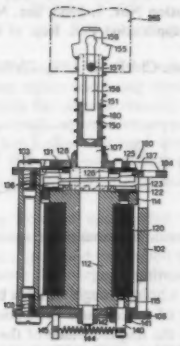
Remo Falconieri, S. Giorgio C., Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Division of Ser. No. 58,201, Jul. 17, 1979, abandoned. This application Apr. 9, 1982, Ser. No. 367,004

Claims priority, application Italy, Jul. 18, 1979, 68696 A/78

Int. Cl.³ B41J *33/14*

U.S. Cl. 400—225 6 Claims



1. A device for intermittently advancing a ribbon in a printing machine, comprising a part for drawing said ribbon along; a motor unit having a cylindrical rotor and a stator movable with respect to the rotor for an alternating motion, wherein the stator and rotor include a plurality of corresponding pole pieces and wherein said stator is actuatable with an impulse of magnetic flux for positioning said rotor to a position where the corresponding pole pieces of the stator and the rotor are faced therebetween; a coupling device which is interposed between the rotor and the part for drawing the ribbon along in order to transform the alternating movements of the rotor into a unidirectional movement of the part for drawing the ribbon along; wherein said coupling device comprises a shaft connected with the part for drawing the ribbon along, first and second members coaxial with the shaft and fixed to the rotor and stator respectively, and an intermediate part which is interposed between said first and second members wherein said first and second members having facing frontal teeth and wherein said intermediate part comprises a central bush fixed to the shaft and a peripheral ring which is inclined with respect to said first and second members and is connected to said central bush, wherein said peripheral ring includes a first series of teeth normally engaged with the teeth of the first member fixed to the rotor and a second series of teeth, which are diametrically opposed to the first series and normally engaged with the teeth of the second member fixed to the stator, and wherein the frontal teeth of said first and second members are so oriented as to only allow transmission of movement from the rotor to the shaft in one sense only; and a stroke limiting device which is interposed between the rotor and the stator for limiting the stroke of the rotor with respect to the stator, said limiting device comprising positioning means for positioning the rotor in a predetermined rest position and returning means for returning the rotor to the rest position after the positioning of said rotor to a position where the corresponding pole pieces of the stator and the rotor are faced therebetween.

4,462,708

AUTOMATED TAPE LETTERING MACHINE

Cleto R. Luartes, Burnsville, and William H. Powell, Jr., Stillwater, both of Minn., assignors to Kroy Inc., Scottsdale, Ariz.

Filed Apr. 8, 1981, Ser. No. 252,699

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—304 36 Claims

1. In a tape lettering or printing apparatus for lettering or printing characters on a tape comprising a tape printing station, a circular rotatable front for providing a raised character in printing alignment at the tape printing station and means for printing characters on the tape in a tape print cycle, including a means for providing a color carrying ribbon and image carrying tape at the tape printing station, a means for advancing the ribbon and tape in alignment with the tape printing station, and a force generating means for exerting a printing force to print characters on the tape at the tape printing station, and wherein the means for printing characters on the tape further comprises a print motor for operating the tape printing apparatus during the tape print cycle, the improvement comprising:

processing means for receiving input data to be printed on the tape and for supplying control signals to the tape printing apparatus to cause the tape printing apparatus to print the input data on the tape;

data input means connected to the processing means for entering input data and transmitting the data in encoded form to the processing means so that the data can be sequentially printed on the tape;

a character positioning motor, operatively connected to the circular rotatable font, for rotating the circular font to provide a raised character at the tape printing station;

character positioning motor control means for causing, in response to receipt of control signals from the processing means, the character positioning motor to rotate and position the font from its present position to a selected character position so that a selected character to be printed on the tape is presented at the tape printing station;

means for deenergizing the character positioning motor prior to aligning the character to be printed on the tape;

print motor control means for causing, in response to control signals from the processing means, the tape print cycle to occur so that the color carrying ribbon and image carrying tape are provided at the tape printing station, the selected character to be printed on the tape is aligned for printing and a printing force is exerted against the color carrying ribbon, the tape and the character on the circular font at the tape printing station so that an image of the character is transferred from the colour carrying ribbon to the image carrying tape; and

means enabling the simultaneous entry and printing of data and permitting the rate of data entry to exceed the rate of

printing, said enabling means including processing means which comprises:

a multiple character input buffer for receiving coded data from the input means at the data rate of the input means;

a programmed microcomputer for sequentially decoding the data in the input buffer and for calculating the amount of rotation of the circular rotatable font necessary to sequentially print each successive character on the tape;

an output buffer connected to and controlled by the programmed microcomputer and connected to control with control signals the character positioning motor through the character positioning motor control means and the print motor through the print motor control means in the sequence programmed into the microcomputer so that each character on the circular rotatable font corresponding to a character entered by the data input means is sequentially positioned at the tape printing station and a tape print cycle is initiated and concluded for each character so that data can be printed on the tape at the printing rate of the tape printing apparatus and subsequent data can be simultaneously entered into said input buffer; and

wherein the character positioning motor control means and the print motor control means each comprise means for converting the logic level signals of the processing means into power level signals sufficient to operate the character positioning motor and the print motor, respectively.

4,462,709

TYPE CARRIER RETURN AND PLATEN LINE SPACE DEVICE FOR TYPEWRITERS

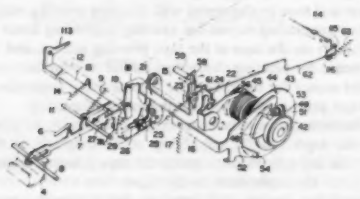
Giancarlo Horeschi, and Gian P. Barozzi, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,414

Claims priority, application Japan, Jul. 16, 1980, 55-97409

Int. Cl.³ B41J *19/70*

U.S. Cl. 400—314 **2 Claims**



1. A carriage return device in a typewriter comprising:

an interposer operable through operation of a key lever for a carriage return;

a cycle bail driven by the interposer;

an actuating bail for performing a cycle of movement having a locus of a predetermined mode to cause the interposer to disengage from the cycle bail;

a carriage return bell crank for operation in association with the interposer when the interposer moves in the direction of disengaging from the cycle bail;

a carriage return clutch operable by the carriage return bell crank;

a carriage driving device for driving a carriage to return through operation of the carriage return clutch, said carriage driving device comprising a stationary mechanism for releasing the carriage from an escapement rack in association with said carriage return bell crank; and

a mechanism operable to return the carriage return bell crank upon completion of carriage return;

characterized in that said actuating bail is driven to perform said movement by a main shaft connected with a driving source through a cycle clutch, which is associated with said cycle bail for intermittently transmitting a driving force from the driving source to the main shaft so that the main shaft can rotate by a predetermined number of times, and that said carriage driving device further comprises:

a rope connected with the carriage for driving the carriage; and

a tension pulley around which said rope is wound and which is connected with a platen driving means for driving a platen by one feed pitch in order to feed paper by one pitch, said tension pulley being displaceable by a predetermined stroke under a lower tension of said rope than a tension to drive the carriage, whereby, when said rope is pulled, said tension pulley displaces by a predetermined stroke to effect the feeding of the paper by one pitch, and then the carriage is driven to return.

4,462,710

MOUNTING DEVICE FOR A NUT TO BE PROVIDED ON A METAL PLATE

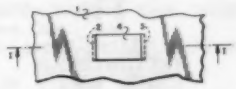
Kajetan Leitner, Am Winacker 18, D-8170 Bad Tölz, Fed. Rep. of Germany

Continuation of Ser. No. 200,148, Oct. 24, 1980, abandoned. This application Nov. 7, 1983, Ser. No. 549,637

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1979, 2943191

Int. Cl.³ F16B *1/00, 37/04*

U.S. Cl. 403—21 **4 Claims**



1. A mounting device for mounting a nut to a plate comprising:

a plate and a mounting cage;

said plate having a hole through which a bolt can pass to the nut and a pair of spaced lugs projecting at substantially right angles to the major surface of the plate;

said mounting cage having the shape of a U-bar with a substantially rectangular cross section including a base and a pair of arms extending from the base at substantially right angles to the base at spaced locations between which the nut can be held, said cage being clamped to said plate with a first surface of said base opposite to the direction in which said arms extend facing said plate;

a hole formed in the base of said cage in alignment with the hole in said plate for the passage of the bolt, resilient clamping tongues extending at an acute angle from an opposite second surface of said base, said tongues extending toward one another and having ends spaced from the base and from one another;

a slot for the passge of one of the lugs being located on each side of said hole, each slot being defined between an edge of said base and an end of one of said tongues, each slot receiving one of the lugs and preventing the removal of the lug to hold said cage clamped to said plate;

said arms, in at least the region of the hole in said base, having an inwardly bent portion overlying said base and extending over the nut.

4,462,711

REFLECTIVE ROAD MARKER

J. Harlan Garner, Rte. 2, Box 215, Gurley, Ala. 35748

Filed May 26, 1981, Ser. No. 266,725

Int. Cl.³ E01F *9/00*

U.S. Cl. 404—10 **5 Claims**

1. A road marker comprising:

a base having a generally flat underside adapted to be attached to a surface of a paved road;

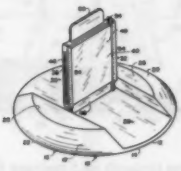
a body region generally rising on an upper side from edges of said base;

an opening formed in the upper side of said body region:

a marker region extending upward normally from the base and from within said opening and rising above said body region, having a pair of opposite, generally flat sides, and

the thickness of said marker region between said sides generally being no thicker than the maximum depth of said opening, and said opening appearing on directly opposite sides of said marker region and extending to the outer edges of said base, and each side configured to receive the full width of said marker region when bent toward said opening on either side of said marker region;

resilient support means coupling said marker region to said base, whereby impact on said marker region tends to cause said marker region to bend into said opening and thereby be protected by said body region;



a reflective material along at least one said generally flat side of said marker region and being viewable as at least one of said generally flat sides is viewed;

said body region extends upward on opposite sides and around said marker region between intersections with said opening and tapering upward from edges, whereby side impacts on lower portions of said marker region are prevented; and

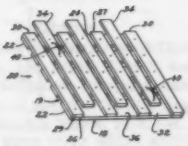
a top region rising from an upper edge of said marker region, and this top region being of a resilient material, whereby an impact upon said top region tends to cause it to bend and to cause the marker region to react to being tilted and to bend into said opening.

4,462,712

METHOD AND APPARATUS FOR A CONSTRUCTION SITE FLOORING SYSTEM

Joe E. Penland, Sr., Nederland, Tex., assignor to Quality Mat Company, Nederland, Tex.

Filed Jul. 16, 1981, Ser. No. 283,830
Int. Cl.³ E01C *5/14*
U.S. Cl. 404—36 **3 Claims**



1. A flooring system for use as the temporary surface of a construction site and roadway leading thereto and adapted for supporting heavy equipment such as oil well drilling equipment, the flooring system comprising:

a plurality of adjacent rows of interlocking flooring units, each unit including

a rectangular base section having a first end and an opposed second end, said base formed of a plurality of parallel boards of substantially equal length;

a rectangular surface section having a first end and an opposed second end, said surface section attached to and overlaying the base section with the side edges and ends of the surface section aligned with the corresponding side edges and ends of the base section, the surface section formed of a plurality of parallel boards of uniform length interconnected substantially perpendicular to the boards of the base section, the second end of the surface section having at least one open locking slot formed by a pair of upper surface boards and the base section;

a locking tab projecting only from the first end of the surface section, the locking tab being aligned with the locking slot of the second end whereby the locking tab of a first flooring unit may be vertically lowered into the locking slot of an adjacent flooring unit to form a portion of the adjacent rows of flooring units; and

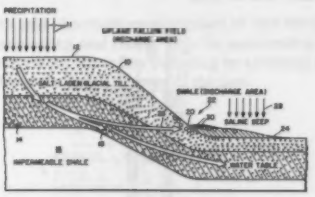
a top layer overlaying the surface sections of the flooring units, the top layer formed of a plurality of boards.

4,462,713

METHOD FOR MINING AND RECLAIMING LAND

Allen K. Zurcher, 509 N. High St., Greene, Iowa 50636, and Wayne F. McFarland, 409 7th Ave., Charles City, Iowa 50616

Filed Jun. 1, 1982, Ser. No. 383,605
Int. Cl.³ C02F *9/00*; E02B *11/00*
U.S. Cl. 405—36 **33 Claims**



1. A method for mining and reclaiming land comprising:

(a) installing subterranean drain pipe to collect subterranean water;

(b) periodically measuring the salinity of the soil at the site of the installation of said subterranean drain pipe to ascertain the feasibility of simultaneous crop production with the collection and purification of said subterranean water at said site and to determine the purity of the water to be returned to said site;

(c) periodically comparing the measurement of salinity of said collected subterranean water with a measurement of said salinity of said soil at said site to determine if the primary source of said salinity in said collected subterranean water is the result of said salinity of said soil or the salinity of underground water received from a recharge area;

(d) purifying said water by removing calcium and magnesium salts from said subterranean water; and

(e) recycling said water back to the surface of the land at either said site of the installation of said subterranean drain pipe or to a recharge area or a combination thereof as a result of said determination of salinity.

4,462,714

METHOD AND APPARATUS FOR SETTING A CEMENT PLUG IN THE WIDE-MOUTH SHAFT OF AN EARTH CAVERN

Charles F. Smith, Missouri City; George R. Parks, Baytown; Gustavo A. Correa, and Ralph N. Holley, both of Houston, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 4, 1983, Ser. No. 481,703
Int. Cl.³ E21D *5/00*; B65G *5/00*
U.S. Cl. 405—55 **10 Claims**

1. Method for setting a cement plug in the wide-mouth shaft of an earth cavern, comprising the steps of:

(a) filling the cavern with a fluid;

(b) installing a fluid fill pipe inside an elongate, inflatable receptacle, the receptacle is in a deflated condition, and the fill pipe has an open end positioned within the deflated receptacle;

(c) lowering the deflated receptacle into the cavern through a substantially vertical first casing, the top end of the casing is at the earth's surface, and the bottom end is at the mouth of the cavern;

(d) extending the length of the fluid fill pipe as the deflated receptacle is being lowered, and simultaneously lowering

a cement fill pipe through the first casing, the cement fill pipe is adjacent to the fluid fill pipe, and the lower end of said pipe is positioned above the receptacle;

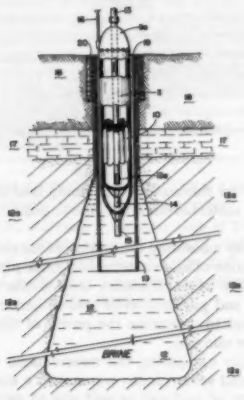
(e) holding the deflated receptacle at a first predetermined point in the first casing during the lowering step;

(f) installing a packer tool on the fluid fill pipe and the cement fill pipe, at the earth's surface, as the deflated receptacle is being held at the first predetermined point;

(g) continuing to lower the receptacle and packer tool until the receptacle reaches a second predetermined point below the lower end of the first casing, at which point the packer tool is positioned above the lower end of the first casing;

(h) setting the packer tool against the first casing;

(i) filling the receptacle, through the fluid fill pipe, with enough fluid to cause it to inflate and seat against the sides of the earth cavern;



(j) passing a given amount of cement slurry down the cement fill pipe, such that the cement fills that part of the cavern defined between the top of the receptacle and the bottom end of the first casing;

(k) pulling the cement fill pipe out of the first casing, while the cement slurry is wet;

(l) allowing the cement slurry to harden, to define a cement plug in the cavern;

(m) drilling into the cement plug and terminating the drilled hole above the inflated receptacle;

(n) lowering a second casing into the first casing, such that the top end of the second casing is at the earth's surface and the bottom end is above the bottom end of the drilled hole;

(o) cementing the second casing to the drilled hole and to the first casing; and

(p) drilling through the cement plug below the bottom end of the second casing until the drill contacts the inflated receptacle and ruptures said receptacle.

4,462,715

SYSTEM FOR THE ONE-STEP DEWATERING OF A TRENCH AND THE CONSTRUCTION OF A PIPELINE BED

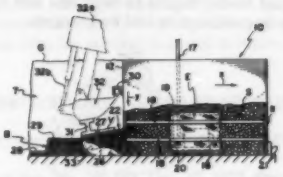
Duwane R. Ashbaugh, Box 16, Six Lakes, Mich. 48886

Filed Sep. 30, 1981, Ser. No. 307,159

Int. Cl.³ E02B *11/00;* **F16L** *1/02, 3/00*

U.S. Cl. 405—157 **8 Claims**

1. A method of forming stone or like particulate material beds for receiving pipelines in the bottom of a trench comprising: digging a trench having side walls and a bottom in ground in which there is ground water at the level of the trench bottom; lowering a generally rectangular enclosure surrounding an interior, having open upper and lower ends, and having front, rear, and side walls, into the trench and supplying stone or the like to the interior of the enclosure; then from within the enclosure pumping ground water from the portion of the trench bottom covered by the enclosure while the enclosure is disposed in the trench; the rear wall of the enclosure having a stone dispensing opening; moving the enclosure forwardly an increment to cause the stone or the like to be dispensed in



completed bed form through said opening from the rear of the enclosure; exerting a downward component of force on the enclosure during the time the enclosure is moved in a forward direction to wedge portions of the stone or the like forming the bed into place as the enclosure is moved in the forward direction, forming a U-shaped bed when the enclosure is moved in he forward direction with the bed having higher side portions to shore up the trench; and laying the pipeline in the bed.

4,462,716

PILE DRIVING

Stanley Merjan, 16 Beacon Dr., Port Washington, N.Y. 11050

Filed Feb. 16, 1982, Ser. No. 349,010

Int. Cl.³ E02D *5/34, 7/14*

U.S. Cl. 405—233 **5 Claims**

1. Method of driving into the soil a pile having a hollow thin-walled continuous shell stem having a bottom and a top, said pile having an enlarged preformed lower tip having a socket into which the bottom of said shell stem is fitted, which comprises

placing a mandrel having a bottom into said stem with the bottom of said mandrel being situated within said socket to transmit hammer blows through said mandrel directly to said tip, said mandrel having a shoulder positioned to overly the top of said shell stem and to limit upward movement of said stem relative to said mandrel during the driving of said pile,

hammering on the top of said mandrel to drive said tip into the soil to a depth of at least about 20 feet,

the outer surface of the thin wall of said stem being in contact with the soil and said stem being thereby frictionally retarded by said soil during said hammering,

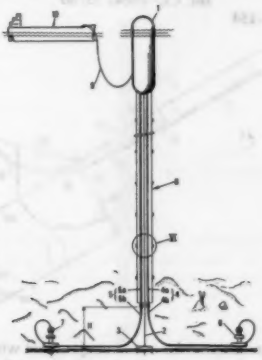
said shoulder acting to prevent separation of said tip from said stem during said hammering, withdrawing said mandrel from said stem and filling said stem with hardenable concrete.

4,462,717

RISER FOR GREAT WATER DEPTHS

Jean Falcimaigne, Bois-Colombes, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jun. 11, 1982, Ser. No. 387,634
Claims priority, application France, Jun. 12, 1981, 81 11790
Int. Cl.³ E21B 43/01
U.S. Cl. 405—195 20 Claims



1. A riser adapted to connect at least one stationary submerged structure to a caisson of positive buoyancy fastened to the water bottom through at least one anchoring line, and with said riser being supported in water by said caisson, said riser comprising holding means (24) for joining together, from the caisson (1), and over a length smaller than the distance separating the caisson (1) from the bottom, at least one continuous guide means (23), wherein is accommodated, with a certain clearance, at least one transfer line (4), connecting the submerged structure (6) to the caisson, said clearance enabling free axial displacement of said transfer line with respect to said guide means, and at least one anchoring line (2) of the caisson (1), and with said guide means terminating, at a distance H from the bottom in a manner such as to permit free dilatation of said at least one transfer line (4).

4,462,718

OIL WELL TREATING METHOD AND COMPOSITION

Homer C. McLaughlin, and Bobby E. Hall, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 714,213, Aug. 13, 1976, abandoned. This application May 4, 1978, Ser. No. 901,664
Int. Cl.³ E21B 43/12, 43/25, 43/27
U.S. Cl. 405—264 10 Claims

1. A method for stabilizing an earth formation which comprises fine particulate materials selected from the group consisting of clay, mineral particles, and mixtures thereof, comprising contacting said formation with an effective amount of copolymer of epichlorohydrin and dimethylamine.

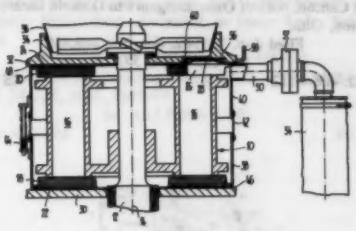
4,462,719

CONCRETE GUN

Hans R. Egger, Zumikon, and Rudolf Vogler, Zürich, both of Switzerland, assignors to Intradym Maschinen AG, Winterthur, Switzerland

Filed May 24, 1982, Ser. No. 381,507
Claims priority, application Switzerland, May 27, 1981, 3467/81
Int. Cl.³ B65G 53/46
U.S. Cl. 406—64 10 Claims

1. A concrete gun comprising in combination a rotor, a plurality of chambers arranged in said rotor in a circular array and extending parallel to the axis of said rotor, sealing plates of elastomeric material engaging the ends of the rotor and closing said chambers, a vent orifice comprising a recess in one of said sealing plates, said recess being located to be successively in



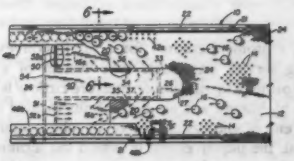
register with said chambers upon rotation of said rotor, an air filter communicating said recess with the surrounding air and a clearing device for the recess including an actuating element extending from the recess to outside the gun.

4,462,720

AIR TABLE SYSTEM

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Division of Ser. No. 321,391, Nov. 16, 1981, which is a continuation of Ser. No. 138,006, Apr. 7, 1980, Pat. No. 4,347,022, which is a continuation-in-part of Ser. No. 947,441, Oct. 2, 1978, abandoned. This application Mar. 10, 1983, Ser. No. 474,822
Int. Cl.³ B65G 51/02
U.S. Cl. 406—84 9 Claims



1. An air table apparatus for the transport of objects from an upstream location to a downstream location, said apparatus comprising:

a table having a surface, edges and an underside with a prearranged pattern of air jet openings in the surface slanted in a downstream direction of object movement and communicating the surface and the underside;

a single file conveying zone at said downstream location;

solid cover means spaced above said surface of said table a distance slightly greater than the longitudinal dimension of the objects being transported and positioned at least over said single file conveying zone;

a plenum connectable to a source of air under pressure underlying and attached to said underside of said table surface to supply air through said jet openings to lift, support and move the objects from said upstream location to said downstream location;

side means positioned along the edges of said table surface between said cover and said table surface; and,

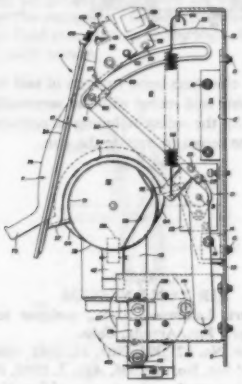
blow back air jets connected to a source of air under pressure for supplying air under pressure into said single file conveying zone in opposition to the direction of normal flow of the objects.

4,462,721

VISUAL CUSTOMER TERMINAL CONSTRUCTION FOR PNEUMATIC TUBE BANKING SYSTEM

Walter G. Anders, North Canton, and Leo J. Grosswiller, Jr., East Canton, both of Ohio, assignors to Diebold Incorporated, Canton, Ohio

Filed Jun. 7, 1982, Ser. No. 385,850
Int. Cl.³ B65G 51/26
U.S. Cl. 406—112 25 Claims



1. A customer terminal for a single conveyor tube visual banking service pneumatic tube system of a type wherein carrier propelling vacuum or pressure airflow is supplied to the system by blower and air shifter units located in the terminal, and an end of said system conveyor tube is connected with the terminal; the improvement in which the terminal includes:

(1) a frame member mounted on a terminal base;

(2) a pair of enclosure members, one of which is provided with an access opening and is mounted in fixed position on said frame member, and the other of which is pivotally mounted on the fixed member and acts as a door for the fixed member access opening;

(3) the door enclosure member being movable between a closed position convering said access opening and an open position telescoped into the fixed enclosure member uncovering said access opening;

(4) each of the fixed and door enclosure members being formed of plastic material and having semi-cylindrical pocket forming wall portions;

(5) coupling means between an end portion of a system conveyor tube and the fixed enclosure member;

(6) the semi-cylindrical wall portions of said pair of enclosure members when in closed position forming a cylindrical extension of said system tube end portions with said cylindrical extension and said system tube end portion having the same internal diameter and their axes coinciding; and

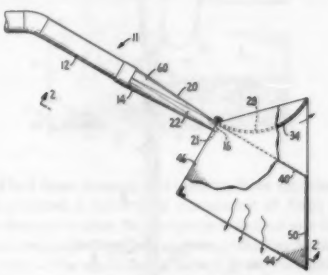
(7) the fixed enclosure member having a closed-end-cup-wall connected with its semi-cylindrical wall portion at the end of said semi-cylindrical wall portion remote from said coupling means.

4,462,722

TRIM SEPARATOR

Imants Reba, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation of Ser. No. 328,355, Dec. 7, 1981, Pat. No. 4,422,565. This application Nov. 24, 1982, Ser. No. 444,146
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.³ B65G 53/60
U.S. Cl. 406—154 8 Claims



1. Apparatus adapted for use in conjunction with a duct for conveying trim in a moving fluid medium and for separating said trim from said fluid medium, said apparatus comprising, in combination:

conduit means having two spaced elongated walls and two interconnected sidewalls forming a generally rectangular-shaped exit opening through which said trim and fluid medium exit in a predetermined direction, said opening having a predetermined thickness defined by said elongated walls;

fluid flow attachment means having a generally curved fluid flow attachment surface leading from said conduit means adjacent to said exit opening to a predetermined location spaced from said exit opening and offset from said predetermined direction, said surface having a radius of curvature at least five times greater in magnitude than said thickness; and

a screen disposed adjacent to said fluid flow attachment surface for interrupting movement of said trim when said fluid medium becomes attached to and flows along said fluid flow attachment surface toward said predetermined location due to the Coanda effect.

4,462,723

INTERNAL BROACHING TOOL

Heinz-Peter Walter, Rüsselsheim, and Horst Hahn, Wölfersheim, both of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach, Fed. Rep. of Germany

Filed May 27, 1982, Ser. No. 382,677
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122574
Int. Cl.³ B23P 15/42
U.S. Cl. 407—18 2 Claims

1. An internal broaching tool comprising:

an elongate base member adapted to be held in a broaching machine;

a shank portion at one end thereof having surfaces enabling said broaching tool to be held in the holder of a broaching machine and for centering a workpiece relative to said tool;

first cutting teeth arranged with the sides thereof progressively increasing taken in a direction away from said shank;

second cutting teeth having a generally uniform size for finishing a broached workpiece to required dimensions, said second cutting teeth being provided on a part of said broaching tool which is capable of elastic deformation to

enable adjustment of the operating dimensions of said second cutting teeth;

recess means formed in said broaching tool at least in the parts thereof adjacent said second cutting teeth; and

an adjusting element engaging with said recess means and cooperating therewith to enable adjustment of said operating dimensions of said second cutting teeth;

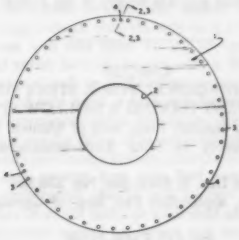
said recess means comprising a first part provided with threads and a second part having a conical configuration coaxially adjoining said first part, with said adjusting element being formed with corresponding conical tensioning faces in contacting engagement with said second part and with a threaded portion engaging said first part for effecting adjustable engagement between said corresponding conical tensioning faces and said second part.

4,462,724

PHOTOCHEMICALLY MACHINED CUTTING WHEEL

Robert E. Miettunen, Athens, and Kenneth H. Shaner, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Aug. 25, 1982, Ser. No. 411,212
Int. Cl.³ B28D *1/04*
U.S. Cl. 407—30 **3 Claims**



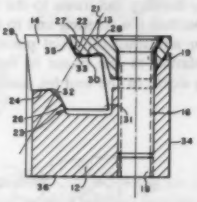
1. A photochemically machined cutting wheel comprising a thin flat metal disk having an inner peripheral cutting edge and having a plurality of locating holes through the disk, the diameter of the holes at one surface of the disk being slightly larger than the diameter thereof at the other surface of the disk, the arrangement of said hole diameters at said surfaces being such as to provide a close tolerance on minimum hole diameters during manufacture of said wheel in order to provide accurate positioning of the wheel during cutting.

4,462,725

METAL CUTTING TOOLS WITH REPLACEMENT INSERT

Amir Satran, Kiriat Bialik, Israel, and Andre Brasey, Villarsiviriaux, Switzerland, assignors to Iscar Ltd., Nahariya, Israel

Filed Dec. 29, 1981, Ser. No. 335,432
Claims priority, application Israel, Jan. 8, 1981, 61884; Switzerland, Mar. 9, 1981, 1589/81
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—92 **6 Claims**



1. A metal cutting tool comprising an elongated tool shank having a cutting end formed at one end thereof; an elongated pocket formed in the cutting end and being longitudinally directed with respect to the tool shank; wall means of said pocket including a longitudinally directed side wall adjacent a longitudinally directed side surface of said shank; a pair of axially directed pocket surfaces angularly directed with respect to each other and defining between them a first elongated corner means, at least one of said pocket surfaces being located on said side wall; an elongated cutting insert comprising an elongated intermediate portion of said insert, a pair of cutting portions of said insert extending substantially colinearly from either end of said intermediate portion, each cutting portion being formed with respective longitudinally transversely directed cutting edges, said insert being receivable and invertible in said pocket so that at any time one cutting portion extends beyond the cutting end and the other cutting portion and the intermediate portion are retained within the pocket; said intermediate portion having a pair of elongated insert surfaces angularly directed with respect to each other and defining between them a second elongated corner means which mates with said first elongated corner means so that when either of said cutting portions extend beyond the cutting end, the longitudinally directed cutting edge thereof is substantially parallel to and slightly offset with respect to an outer surface of said side wall; and clamping means mounted on said shank and adapted to exert a transversely directed clamping force on said cutting insert, said force having orthogonally directed components which respectively clamp the insert surfaces against the respective pocket surfaces; the cross-sectional dimensions of said cutting end with the cutting insert clamped in position being such as to enable said cutting end to pass through a bore nominally large enough to admit said tool shank therethrough.

4,462,726

APPARATUS FOR FORMING A GROOVE

Fred H. Silvey, Rowland Heights, and Jeffrey G. Smith, Velinda, both of Calif., assignors to Irontite Products Co., Inc., El Monte, Calif.

Filed Jun. 8, 1981, Ser. No. 271,711
Int. Cl.³ B23B *39/00*
U.S. Cl. 408—76 **9 Claims**

1. A device for forming an annular groove in the flat surface of a cylinder head for a six or eight cylinder engine comprising:

a tool bit having

a cutting portion thereon;

a cutting arm including

means for fixing the tool bit thereto;

a rotating unit including

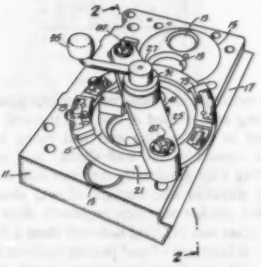
means for fixedly mounting the cutting arm in a selected position relative thereto, and means for selectively locating the cutting arm relative to the rotary unit for selecting the relative positions thereof;

a frame for rotatably supporting the rotating unit, the frame including

a flat cylinder head contact surface for supporting the frame on a cylinder head, means for positioning the frame in proper groove-forming position on the cylinder head,

a pair of rotatable permanent magnet fixing means for releasably holding the frame to the cylinder head,

means connecting the rotating unit to the frame including means for adjusting the axial position of the rotating unit relative to the frame in order to control the cutting depth of the tool bit, and



each of the pair of rotatable permanent magnet fixing means including

a permanent magnet having a longitudinal axis and a north pole portion and a south pole portion parallel to said axis, said permanent magnet mounted for rotation in the frame about said axis with the axis and both pole portions being perpendicular to the flat cylinder head contact surface of the frame,

a pair of hold down inserts in the cylinder head contact surface of the frame, and

means for selectively aligning directly one of the magnetic pole portions with only a single insert to impose the maximum magnetic field between a cylinder head and the magnetic pole portion and for selectively aligning both of the magnetic pole portions with both inserts to short the magnetic field across the inserts in order to minimize the magnetic attraction between the magnetic pole portions and a cylinder head.

4,462,727

FLUTED TAP

Fritz Marburger, Frankfurt am Main, Fed. Rep. of Germany, assignor to Günther & Co.

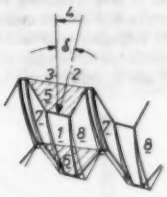
Filed Oct. 2, 1981, Ser. No. 308,050

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037568

Int. Cl.³ B23G *5/06*

U.S. Cl. 408—220 **4 Claims**

1. A fluted screw tap comprising a plurality of thread lands (1), each said thread land having a pair of outwardly facing flanks (7, 8), wherein the improvement comprises that in each said pair of flanks each flank has a different relief ground flank surface, said flank surfaces on each said thread flank are asymmetrically relief-ground and extend in a spiral form over the length of said thread land, each said thread land has a corner (15) which rests against the cut thread, each said flank surface has a relief grinding angle extending along said thread flank gradually approaching the value zero at the end of said thread land at which said corner (15) is located, and the relief grinding



angle of each said flank is different from the relief grinding angle of the other said flank of each said thread land.

4,462,728

ACCESSORY FOR ELECTRIC DRILL

Frank Sturgis, 44 Washington St., Shrewsbury, Mass. 01545

Filed Nov. 18, 1982, Ser. No. 442,509

Int. Cl.³ B23B *31/06*

U.S. Cl. 408—241 R **6 Claims**

1. Accessory for electric drill, comprising:

(a) an elongated handle,

(b) a threaded spindle extending from one end of the handle for removable engagement with a threaded aperture in the side of the body of the drill, and

(c) a gear mounted on the end of the handle for engagement with a geared chuck mounted on the drill, the spindle extending axially a substantial distance beyond the gear.

3. Accessory as recited in claim 1, wherein the threaded aperture in the body of the drill is selected so that not only does the threaded spindle engage it to hold the handle rigidly, but the threaded spindle also fits snugly in the lateral bore of the chuck.

4,462,729

EXPANSION DOWEL FOR A STRUCTURAL COMPONENT HAVING A HOLLOW SPACE

Raimer Uhlig, and Gusztav Lang, both of Munich, Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 2, 1981, Ser. No. 326,589

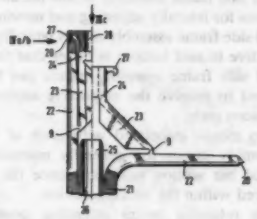
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046290

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—15 **2 Claims**

1. Expansion dowel for use in slabs, masonry and similar structural components having a face surface and a hollow space inwardly of the face surface so that the dowel can be inserted through the face surface into the hollow space, said dowel comprising an axially extending shaft part, expansion arms flexibly connected to said shaft so that said arms can be angularly displaced relative to the axis of said shaft, support levers flexibly articulated to said expansion arms, a link interconnecting said support levers at a location spaced from the

connection of said levers to said expansion arms, said expansion arms and support levers being angularly displaceable relative to the axis of said shaft part between an insert position with said expansion arms and support levers extending generally parallel to the axis of the shaft part and an expanded position where said expansion arms extend angularly outwardly from said shaft part with said support levers disposed at an acute angle relative to said expansion arms and to the axis of



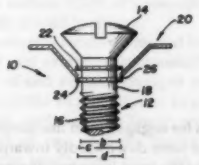
said shaft part, wherein the improvement comprises lock means for releasably securing said expansion arms and support levers in the insert position, said stop means comprise hook-shaped elements formed on said link, and rib-like projections formed on said expansion arms with said hook-like elements engaging said rib-like projections in the insert position of the dowel for securing said expansion arms and support levers in the insert position.

4,462,730

PAINTED SCREW AND WASHER ASSEMBLIES

Rudolph E. Knohl, Bartlett, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 2, 1981, Ser. No. 230,218
Int. Cl.³ F16B *39/24*
U.S. Cl. 411—371 8 Claims



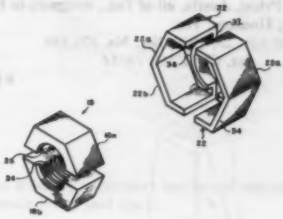
1. A pre-assembled fastener and washer unit comprising a fastener having a shank with threads on a portion thereof and a head at one end said head having an upper and a lower surface, said shank having threads with a first predetermined lateral dimension and, an unthreaded region situated between the threads and side head, a first annular protrusion having a second predetermined lateral dimension greater than the first extending outwardly from said unthreaded shank region, a second annular protrusion having a third predetermined lateral dimension also greater than said first extending outwardly from said unthreaded shank, said second protrusion being spaced farther from the fastener head than said first protrusion, a washer member having an upper and lower surface and a hole passing generally axially therethrough the periphery of the hole having a fourth predetermined lateral dimension which is greater than the first but less than the second and third such that the washer, when assembled with the fastener by passing the periphery of the washer over the threads and forcing the washer over said second protrusion, will be retained between said first and second protrusions at a position spaced from the lower surface of the head so that the upper and lower surfaces of the fastener head and washer will be accessible for painting and the like.

4,462,731

SPLIT NUT ASSEMBLY

William Z. Rovinsky, 212 Haypath Rd., Old Bethpage, N.Y. 11804, and Isaac Frucht, 196-47 73rd Ave., Flushing, N.Y. 11366

Filed May 10, 1982, Ser. No. 376,277
Int. Cl.³ F16B *37/08*
U.S. Cl. 411—433 4 Claims



1. A split nut assembly for mounting on and engagement with a threaded shaft or stud without passing over the end of said shaft held together by tightening of said assembly and separating completely upon loosening of said assembly comprising:

(a) nut means consisting of two parts forming a nut when assembled having a threaded opening for engagement with said shaft, having an outer surface shaped to permit gripping thereof, and further having an internal annular recess on at least one side surrounding said threaded opening; and

(b) retaining shell means consisting of two parts forming when assembled a wall section with an opening therethrough sufficiently large to accomodate said shaft, and having an annular rim extending from one side of said section, the inner surface of said rim shaped to fit over and engage the outer surface of said nut means, and the outer surface of said rim being shaped to permit gripping thereof by a tool so that rotation of said shell will cause rotation of said nut, the parting lines between nut parts and those between shell parts being offset by 90°, and said shell being provided with an annular hub inside of and spaced from said rim surrounding its opening, said hub fitting into said recess of said nut means for facilitating ease of assembly and use of said split nut assembly.

4,462,732

PROCESS FOR MANUFACTURING A CAN LID

Siegfried Bloeck, Kreuzlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 16, 1983, Ser. No. 466,951
Claims priority, application Switzerland, Mar. 5, 1982, 1380/82
Int. Cl.³ B21D *51/00*
U.S. Cl. 413—8 2 Claims

1. A process for manufacturing a metal can lid which is lacquer-coated on both sides and provided with a sealed-on

closure strip having a sealing surface of polyamide covering the pouring outlet of the lid comprising heating the can lid after the closure strip has been sealed thereon until the polyamide melts and thereafter cooling the can lid.

4,462,733

BEAM TYPE RACKING SYSTEM

Faustyn C. Langowski, Georgetown; Joe R. Berry, Round Rock, and Joseph R. Priest, Austin, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Apr. 23, 1982, Ser. No. 371,144
Int. Cl.³ E21B *19/14*
U.S. Cl. 414—22 **4 Claims**

1. A pipe racking system comprising:
a vertical track, rotatable about a vertical axis;
a lifting assembly adapted for vertical movement along said track;
a horizontal beam for supporting said vertical track;
a movable carriage connecting said vertical track to said horizontal beam;
said lifting assembly being supported by a wire rope running from said lifting assembly inside the vertical track and outside the carriage to a source of lifting power;
a fixed sheave mounted in said carriage and serving as a first point of contact for said wire rope running from said lifting head to said carriage; and
a rotatable sheave mounted in said carriage and serving as a second point of contact for said wire rope, said rotatable sheave being rotatable about an axis which coincides with a line drawn along the path of the wire rope between the fixed and rotatable sheave in said carriage and tangent to each of said sheaves.

4,462,734

BULK TOBACCO RACKING DEVICE

John C. Green, Rte. 1, Box 208, Lillington, N.C. 27546, and Ronald E. Wheeler, Rte. 3, Angier, N.C. 27501

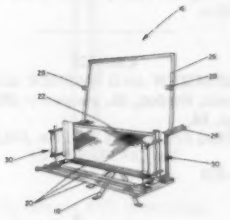
Filed Jul. 12, 1982, Ser. No. 397,111
Int. Cl.³ A24B *1/10*
U.S. Cl. 414—26 **10 Claims**

1. A bulk tobacco racking device for assisting in the loading of a bulk tobacco rack of the dual sectional type having a tine section, a mating elongated bar section, and latch means extending from one section and operative to engage the other section so as to create a coupled relationship between the two rack sections to form said bulk tobacco rack, said bulk tobacco racking device comprising:

a. a bottom that underlies said elongated bar section of said bulk tobacco rack and generally acts to support tobacco leaf material during the rack loading operation;

b. a pair of laterally spaced side frame assembly means extending generally upwardly in laterally spaced apart relationship about opposite sides of said bottom for receiving respective sections of said bulk tobacco rack therebetween and for assisting in loading tobacco leaf material between the two bulk tobacco rack sections; said laterally spaced side frame assembly means including;

1. means for laterally adjusting and moving at least one of said side frame assembly means laterally back and forth relative to said bottom in order that the span between said side frame assembly means can be properly adjusted to receive the respective sections of said bulk tobacco rack;
2. stop means associated with each of said side frame assembly means for generally maintaining said elongated bar section stationary once the same has been placed within the racking device;
3. side retaining means extending generally vertically about the end areas normally occupied by said bulk tobacco rack for retaining tobacco leaf material within the racking device as the tobacco leaf material is deposited and loaded over said elongated bar section during the loading operation;



4. guide means for engaging said tine section and generally directing the same downwardly towards said elongated bar section as the same is pushed downwardly such that the two rack sections are properly aligned in order that the latch of one section will properly align, engage and latch with the other section such that once latched tobacco leaf material will be confined within the two rack sections and generally be held therein by the presence of tines extending from said tine section;

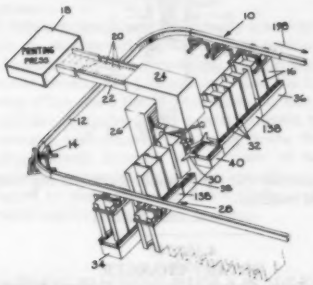
c. press means associated with said racking device for engaging said tine section, after the racking device has been loaded with tobacco leaf material and the tine section has been properly aligned and engaged with said guide means of said side frame assembly means, for pressing said tine section downwardly towards said elongated bar section such that said latch means of one section will effectively engage and latch the other section so as to couple the two sections of said bulk tobacco rack together; and

d. wherein said side retaining means of said side frame assembly means is movable between an inside position and an outside position and is normally biased to assume said inside position, whereby said side retaining means can move from said inside position toward said outside position in response to said bulk tobacco rack engaging the same as the bulk tobacco rack is pulled from the racking device.

4,462,735
NEWSPAPER LIVE STORAGE BUFFER

Lawrence J. Bain, LaGrange, Ill.; Robert D. Eckerson, Merrimac, and Paul D. Siniscal, Hollis, both of N.H., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 27, 1982, Ser. No. 382,539
Int. Cl.³ B65G 57/14
U.S. Cl. 414—37 3 Claims



1. An apparatus for receiving an imbricated stream of newspapers from a printing press accumulating them in individual vertical stacks at a first transfer location and moving the stacks to a second transfer location where they are again formed into an imbricated stream, said apparatus comprising:

(a) an endless conveyor having longitudinal runs and lateral runs which connect the ends of the longitudinal runs,

(b) a plurality of carrier elements dependent from said endless conveyors and moveable there around,

(c) vertically elongated containers removably mounted on and dependent from said carrier elements during travel along the longitudinal runs of said endless conveyor to transport vertical stacks of newspapers from the one location to the second location,

(d) linear conveyor means positioned lower than said endless conveyor and extending substantially parallel to the lateral runs of said endless conveyor adjacent both the first location and the second location to support and move said containers, each of said linear conveyor means being comprised of two sections having outer ends located beneath the longitudinal runs and inner ends separated from each other located between the longitudinal runs;

(e) rotary indexing means positioned between said inner ends of said linear conveyor means to move said containers in sequence from one of said inner ends to one of the newspaper transfer locations and then to the other of said inner ends; and

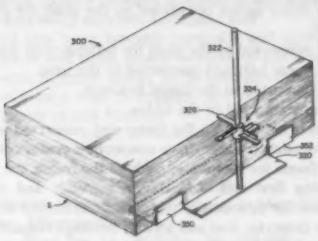
(f) vertically moveable elevator means at the outer and inner ends of said linear conveyor means to mount and to demount said containers on and off, respectively, of said carrier elements and said rotary indexing means.

4,462,736
PAPER BATCH SELECTOR

Carrell L. Jenkins, 20 Skidmore Ct., Towson, Md. 21204

Filed Nov. 29, 1982, Ser. No. 445,078
Int. Cl.³ B65G 59/02
U.S. Cl. 414—114 9 Claims

8. A paper stack divider of a type suitable for manual rotation comprising: a rotor having hub structure, a plurality of blades extending from the hub structure in the relation of successive steps in a spiral staircase, for dividing the paper stack into successive batches by said rotation, a shaft slidably and rotatably supporting said rotor, and a base fixing said shaft upright in position for permitting sliding of the rotor vertically downward along a said paper stack once each revolution of the

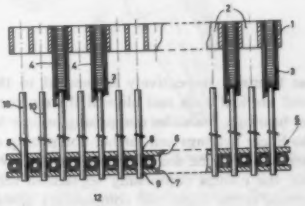


rotor whereby successive batches of said stack are offset from a remainder of said stack.

4,462,737
DEVICE FOR ADVANCING PARTS CONTAINED IN MAGAZINES

Jan Bouwknegt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1981, Ser. No. 308,963
Claims priority, application Netherlands, Nov. 6, 1980, 8006058
Int. Cl.³ B65G 59/02; H05K 13/02
U.S. Cl. 414—118 6 Claims



1. A device for advancing a number of stacks of parts, each of said stacks being accommodated in a tubular magazine, comprising at least one grid having a matrix of openings for accommodating the magazines in a pattern according to which the parts are to be arranged on a printed circuit board, and a corresponding number of pins, each pin being aligned under a respective stack,

characterized by comprising a holder disposed underneath the grid and movable in the direction of the grid, said holder having a matrix of guides which corresponds to the matrix of openings in the grid, each of said pins being accommodated in one of said guides; and further characterized in that said holder comprises means for adjusting the friction between each of the pins and the holder after a movement of the holder.

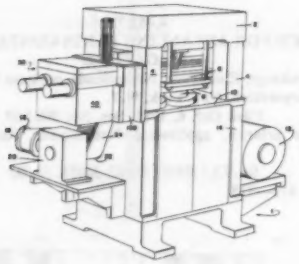
4,462,738
FEED AND TRANSFER SYSTEM

Harry J. Walters, Fallston, and Ralph D. Gerbes, Glen Burnie, both of Md., assignors to M. S. Willett, Inc., Cockeysville, Md.

Continuation of Ser. No. 005,268, Jan. 22, 1979, abandoned. This application Aug. 3, 1981, Ser. No. 289,612
Int. Cl.³ B65G 25/00, 59/06
U.S. Cl. 414—127 24 Claims

14. Rotary to reciprocal feed and transfer apparatus comprising

a base,
rotary bearings connected to the base,
a shaft mounted in the rotary bearings,
rotary drive means connected to the shaft for turning the shaft,
a cam connected to the shaft for turning with the shaft,
plural linear bearings connected to the base,
slides supported in the linear bearings,
a frame connected to the slides,
followers mounted on the frame and connected to the cam,
reciprocating transfer drive connection means connected to the frame for reciprocating with the frame, the base comprising first and second vertical ends and connecting means for connecting the ends wherein the rotary bearings comprise first and second bearings respectively connected in alignment in the first and second vertical ends wherein the linear bearings comprise plural pairs of linear bearings and wherein each pair comprises first and second



linear bearings respectively connected to the first and second vertical ends and aligned therein parallel to the roller bearings, the slides comprising hollow bars moving in the linear bearings and further comprising clamps connected to the frame and clamping the hollow bars to the frame, the clamps comprising segmented recesses in an underside of the frame and complentary upward opening U-shaped lugs with tapped holes in upward spaced faces thereof for receiving bolts extending through the frame, and cantilever mounting means for connecting the base to a press, the mounting means having vertically oriented webs with first and second vertical ends and a flange on at least one end and faces for abutting the base and a press, and having openings for receiving fasteners, and the faces having recesses for aligning with complementary recesses in the base and a press and shear blocks mounted in the recesses for sustaining vertical stress and alleviating vertical shear stress on the fasteners.

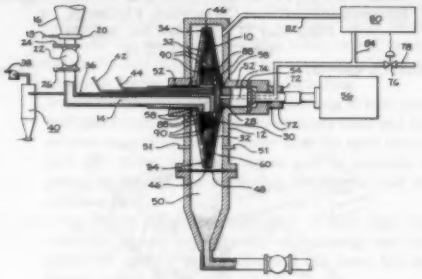
4,462,739

DRY PULVERIZED SOLID MATERIAL PUMP

John W. Meyer, Palo Alto; John H. Bonin, Sunnyvale, and Arnold D. Daniel, Jr., Alameda, all of Calif., assignors to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Mar. 30, 1982, Ser. No. 363,539
Int. Cl.³ F23D *11/06*
U.S. Cl. 414—217 **2 Claims**

1. Apparatus for continuous feeding pulverized material into a high pressure container, said apparatus including a stationary feed pipe for feeding the pulverized material into the high pressure housing, a rotor mounted concentric with the end of the stationary feed pipe for receiving the pulverized material, said rotor including a plurality of radial flow channels, each of said radial flow channels including a sprue section and a control nozzle section, the feed pipe and the rotor defining an annular spin-up chamber and wherein the improvement comprises at least one impeller mounted on the rotor and project-



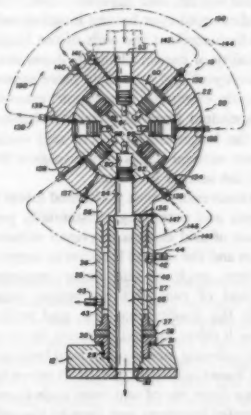
ing into the annular spin-up chamber for imparting torque to the pulverized material.

4,462,740

ROTARY CHARGER

Viktor Cytra, Delta, Canada, assignor to Luaaron Metals Ltd., Vancouver, Canada

Filed Sep. 4, 1981, Ser. No. 299,367
Int. Cl.³ C10J *3/30*
U.S. Cl. 414—220 **5 Claims**



1. A rotary charger adapted to feed material into a vessel operating under pressure and comprising a casing having an inlet opening and an outlet opening, a rotor mounted within the casing and having a plurality of cylinders opened to an outer surface of said rotor, a free piston in each cylinder, a drive mechanism for rotating the rotor intermittently to register the cylinders sequentially with the inlet and outlet openings, pressure equalizing means associated with the casing and connecting the cylinders to one another and to the interior of the vessel whereby as a charged cylinder is moved from the inlet to the outlet openings the pressure within that charged cylinder is progressively increased substantially from atmospheric to the operating pressure of the vessel, said pressure equalizing means comprising a plurality of spaced first outlets in the casing arranged after the outlet opening and before the inlet opening as the rotor rotates;

a plurality of first spaced inlets arranged after the inlet opening and before the outlet opening as the rotor rotates;

said first outlets and first inlets arranged in pairs whereby a first outlet at a predetermined circumferential distance

after the outlet opening communicates with a first inlet at about the same distance before the outlet opening to equalize the pressure in the cylinders of the pair;

a second outlet just circumferentially prior to the inlet opening to communicate with atmosphere a cylinder just prior to the inlet opening;

a second inlet on each side of the outlet opening;

a third outlet communicating the vessel pressure with said second inlets whereby the cylinder about to register with the outlet opening is at vessel pressure and the cylinder that has just registered with the outlet opening is at vessel pressure;

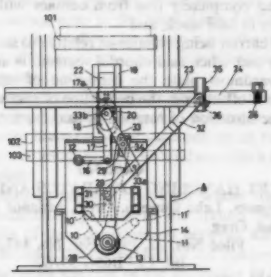
and fluid pressure means individually connecting each cylinder to an external source of fluid pressure whereby a charged cylinder is pressurized when in register with the outlet opening to a pressure exceeding the operating pressure of the vessel thereby extending the free piston of that cylinder to discharge the material therein into the outlet opening, said pressure equalizing means then serving to progressively decrease the pressure of the discharged cylinder substantially from the operating pressure of the vessel to atmospheric as that cylinder moves from the outlet opening to the inlet opening.

4,462,741

PRESSING MACHINE WITH A BUILT-IN ROBOT

Atushi Sogawa, and Seiji Mukumoto, both of Tokushima, Japan, assignors to Nagao Iron Works Ltd., Tokushima, Japan

Filed Jun. 14, 1982, Ser. No. 387,908
Claims priority, application Japan, Apr. 10, 1982, 57-60160
Int. Cl.³ B65H *5/10*
U.S. Cl. 414—225 **2 Claims**



1. A crank pressing machine, comprising:

a frame means and built-in robot means for loading a workpiece to be fabricated and unloading a fabricated product, said robot means being disposed in a space enclosed by said frame means behind a fabricating station, and a pair of spaced material engaging means provided on a feed bar extending across the front of said machine;

means supporting said feed bar for both vertical and lateral movement;

a driving means having a drive shaft;

a lift plate cam and a feed plate cam both mounted on said drive shaft of said driving means;

plural swing arms each of which is in contact with the periphery of a one of said cams and is adapted to be actuated in conformity with the profiles thereof;

a first lever shaft on said frame means and on which said swing arm for said lift cam is mounted and a second lever shaft on said frame means and on which said swing arm for said feed cam is mounted; and

an actuation means for transmitting the actuation of said swing arms to said feed bar, said actuation means comprising a lift arm connected to said swing arm operatively engaging said lift cam through said first lever shaft and a drive arm connected to said swing arm operatively engaging said feed cam through said second lever shaft, said lift arm and said drive arm being constructed so that both are coupled to said feed bar;

vertical guide means provided on said frame means;

slider means slidably movably mounted in said guide means;

said lift arm being movable vertically; and

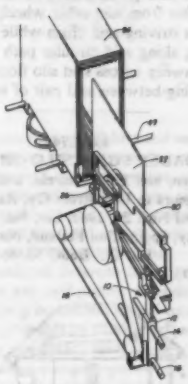
said drive arm being movable vertically and laterally on a fulcrum on said slider means movable up and down along said vertical guide means, to thereby move said lift arm and said drive arm to transmit the vertical and lateral movements to said feed bar.

4,462,742

DISKETTE PICKER

Anna M. Hrsdel, Mustang, Okla., assignor to Magnetic Peripherals, Inc., Minneapolis, Minn.

Filed Jun. 11, 1982, Ser. No. 387,685
Int. Cl.³ G11B *17/22*
U.S. Cl. 414—280 **6 Claims**



1. A diskette picker for gripping a magnetic storage disk and retracting it from a disk storage housing and releasing the disk for loading onto a disk drive, the picker after the disk has been used, returning the disk to the disk storage housing, the picker comprising:

a pair of flippers pivotally mounted on a picker assembly the flippers including a flipper nose for engaging each side of the edge of the disk, a flipper arm integrally attached and extending outwardly from the flipper nose and a flipper arm pin attached to the end of the flipper arm;

a spring having a pair of spring arms, the spring arms engaging the flipper arm pins for biasing the flipper noses inwardly toward each other; and

release means for engaging the flippers and pivoting the flipper noses away from each other and releasing the disk when loading the disk on a disk drive.

4,462,743

APPARATUS FOR UNLOADING SILO

Harvey D. Romberg, Winneconne, Wis., assignor to Sherwood Systems, Inc., Appleton, Wis.

Filed Jun. 11, 1982, Ser. No. 387,431
Int. Cl.³ B65G *65/24*
U.S. Cl. 414—306 **11 Claims**

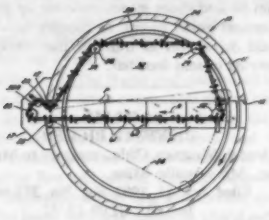
1. Apparatus for unloading material from a silo having a floor and an opening in the wall of said silo above said floor, said apparatus comprising:

a pair of rotatable guide members;

means for moving said guide members in a circular path above said silo floor, said guide members being spaced apart a predetermined angular distance on said circular path;

a pair of rotatable chain supporting wheels, one of said wheels being located in a fixed position near said opening, and the other of said wheels being located in a fixed position within said circular path;

an endless flexible cutting chain reeved around said wheels



and around said guide members and being temporarily disengageable from said other wheel;

and means for driving said chain while said guide members are moving along said circular path whereby reaches of said chain sweep across said silo floor without crossing a line extending between said pair of wheels.

4,462,744

UNLOADER FOR A SILO OR SIMILAR

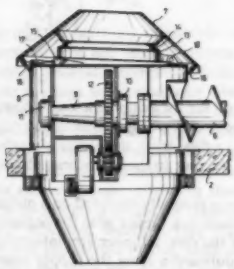
Juhani Rasilainen, and Esko Saarela, both of Lönnström Oy, Finland, assignors to Lönnström Oy, Rauma, Finland

Filed Nov. 24, 1981, Ser. No. 324,407

Claims priority, application Finland, Nov. 28, 1980, 803705

Int. Cl.³ B65G *65/46*

U.S. Cl. 414—311 **5 Claims**



1. An unloader for a silo or the like for transferring material stored therein towards an outlet opening on the bottom of the silo, said unloader comprising a pivot frame mounted on the bottom of said silo for rotation around a vertical pivot axis and an upper protecting hood, a horizontal transport screw supported on said pivot frame for rotation around its longitudinal axis, and driving means for rotating said pivot frame and for rotating said transport screw, means for mounting said protecting hood on the upper part of said pivot frame to be rotationally stationary relative to said pivot frame but rotatively tiltable relative to the pivot axis of said pivot frame during rotation of said pivot frame.

4,462,745

PLATE FEED APPARATUS

Peter E. Johnson, and James Young, both of P.O. Box 1692, Corvallis, Oreg. 97330

Filed Mar. 18, 1982, Ser. No. 359,201

Int. Cl.³ B65G *59/00*; B65H *5/12*

U.S. Cl. 414—330 **12 Claims**

1. A feed apparatus for sequentially removing a single plate or the like from a stack of such plates, said apparatus comprising:

(a) a cylindrical carrier having a central axis;

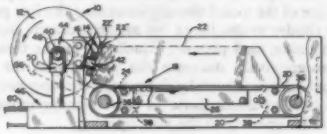
(b) said carrier defining a chordal segment on a portion of its periphery;

(c) said chordal segment having air inlet means opening therein;

(d) feed means for moving said stack of plates towards said carrier after each successive plate is removed from the stack;

(e) stop means for indexing said stack of plates so that the forwardmost plate is oriented generally tangential to said carrier and is located proximate the outer periphery thereof;

(f) means for rotating said carrier about its central axis;



(g) vacuum means for drawing a sufficient volume of air into said air inlet means to pull said forwardmost plate away from said stack and into contact with said chordal segment when said chordal segment is aligned with said plate;

(h) said chordal segment being sufficiently large relative to the diameter of said carrier that when said forwardmost plate is pulled into contact with said chordal segment soley by said vacuum means, said forwardmost plate is pulled completely free from contact with the remaining plates in said stack; and

(i) said carrier being positioned relative to said stack of plates such that when said chordal segment is aligned with said forwardmost plate the centerline of said forwardmost plate is offset from the centerline of said chordal segment in the direction of rotation of said carrier.

4,462,746

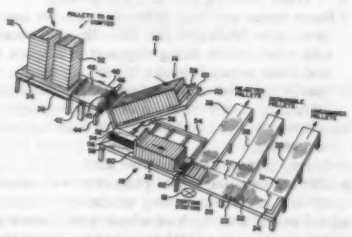
PALLET HANDLING APPARATUS AND METHOD

John S. Smets, Lake Oswego, Oreg., assignor to Smetco, Inc., Portland, Oreg.

Filed Nov. 22, 1982, Ser. No. 443,622

Int. Cl.³ B65G *59/02*

U.S. Cl. 414—330 **13 Claims**



1. An apparatus for handling pallets, comprising:

tiltable pallet stack receiving means for receiving a first upright stack of pallets at a pallet stack station and for tilting the first stack downwardly to a generally horizontal position;

means for laterally displacing the first stack from a position in endwise alignment with said pallet stack station to one in endwise alignment with a pallet sorting station laterally offset from said pallet stack station; and

pallet indexing means for displacing the horizontally disposed first stack in an endwise direction toward the pallet

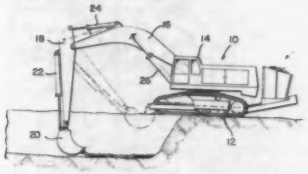
sorting station as pallets are removed from an end of the first stack while simultaneously tilting a second stack of pallets downwardly from an upright position at the pallet stack station to a generally horizontal position in preparation for lateral displacement of the second stack to said position in endwise alignment with said pallet sorting station.

4,462,747

MATERIAL CONVEYOR FOR USE WITH A BACKHOE

Thomas J. Caplis; Carrol E. Peck, and John C. Felton, all of Missoula County, Mont., assignors to Felco, Inc., Missoula, Mont.

Filed Feb. 8, 1982, Ser. No. 346,900
Int. Cl.³ B65G *41/00*
U.S. Cl. 414—567 **8 Claims**



6. A method of providing bedding material in the bottom of a trench dug by a backhoe excavator having a pair of articulating arms, one arm having a bucket secured thereto, by conveying bedding material from the rear of the excavator opposite the pair of articulating arms to the front thereof adjacent the pair of articulating arms without having to rotate the turret and articulating arms of the excavator from the position used to dig the trench, comprising:

digging an elongated trench with the bucket of the articulating arms of the backhoe excavator, the excavator positioned adjacent the trench, with the bottom of the trench being at a lower level than the ground on which the excavator is resting;

providing a bedding material conveyor whose travel path extends substantially parallel to the trench being dug, longitudinally of the excavator and between the crawler tracks and beneath the turret thereof for conveying bedding material from the rear of the excavator to the front end thereof adjacent the pair of articulating arms for discharge into the trench;

providing a hopper mounted above the infeed end of the conveyor immediately adjacent the rear end of the excavator and opposite the articulating arms of the excavator for holding bedding material to be discharged;

filling the hopper with bedding material to be conveyed without use of the bucket and articulating arms of the backhoe excavator;

moving the conveyor belt with bedding material to be discharged supported thereon from the hopper to the discharge end of the conveyor belt where it falls into the trench; and

spreading the bedding material along the bottom of the trench.

4,462,748

INDUSTRIAL ROBOT

Hajimu Inaba, Hino, and Shigemi Inagaki, Kokubunji, both of Japan, assignors to Fujitsu Fanuc Ltd., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,873
Claims priority, application Japan, Jul. 4, 1981, 56-104776
Int. Cl.³ B25J *11/00*
U.S. Cl. 414—738 **8 Claims**

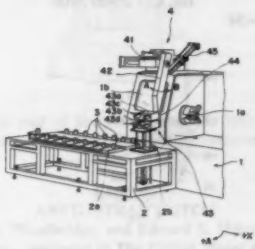
1. An industrial robot, comprising:

an arm rotatable in a plane perpendicular to the longitudinal axis of a spindle of a machine tool;

wrist means attached for rotation at one end of said arm, said wrist means having a rotary shaft;

gripper means for gripping objects and being connected to the rotary shaft of said wrist means for being rotated thereby;

first and second cylinders connected coplanar to said arm, said first cylinder being fixed relative to said arm and said second cylinder being movable longitudinally of said arm;



a piston rod interconnecting said first and second cylinders, said piston rod having a first piston at one end received in said first cylinder and a second piston at the other end received in said second cylinder, said piston rod being moved longitudinally of said arm by introducing a fluid selectively into said first and second cylinders;

a pulley affixed to said first cylinder; and

tension means connected between the rotary shaft of said wrist mechanism and said pulley, wherein

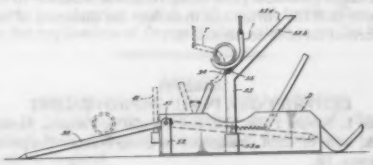
said second cylinder is connected to said tension means, and said tension means is pulled by driving said second cylinder, thereby rotating said rotary shaft.

4,462,749

PIPE HANDLING APPARATUS

Roger A. Crocker, and Jim Schoolcraft, both of Box 37, Wickett, Tex. 79788

Filed Jul. 21, 1982, Ser. No. 400,347
Int. Cl.³ E21B *19/14*
U.S. Cl. 414—748 **2 Claims**



2. A pipe handling apparatus for laterally shifting a joint of pipe comprising:

(a) base means having an upstanding member with an upper inclined surface with a central opening in said upper surface for receiving a pipe trough;

(b) first pipe receiving means for moving a joint of pipe onto said upper inclined surface;

(c) movable means for temporarily spanning said opening in said upper surface to support a joint of pipe as it moves across said opening in said upper surface;

(d) second pipe moving means mounted in said base for moving a joint of pipe upwardly along said upper inclined surface towards said central opening for moving a joint of pipe into a pipe trough received in said central opening,

(e) the pipe moving means includes link means connecting

said first pipe moving means and second pipe moving means.

4,462,750

ELECTRIC FAN ASSEMBLY

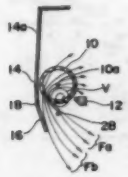
Norio Sugawara; Motoyuki Nawa, and Yutaka Takahashi, all of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 22, 1981, Ser. No. 333,618

Claims priority, application Japan, Dec. 25, 1980, 55-186423; Feb. 2, 1981, 56-14794; Apr. 15, 1981, 56-57365

Int. Cl.³ F04D *5/00*

U.S. Cl. 415—54 **5 Claims**



1. An electric fan assembly comprising:
a generally cylindrical cross-flow fan rotatable about a fan axle to produce a vortex of air and a flow of air current,
a stabilizer positioned at one side of the cross-flow fan,
a rear guider being positioned at the opposite side of the cross-flow fan and having an upstream edge with respect to the direction of flow of the air current, and
a single pivotable plate having an upstream edge connected to a hinge at a downstream edge of the rear guider in the vicinity of the vortex,
said stabilizer and said single pivotable plate constituting an air outlet,
said rear guider having a construction extending in a straight line tangentially both upstream and downstream from a position extremely close to the circumference of the cross-flow fan,
said upstream edge of the rear guider extending substantially above the cross-flow fan,
said air current, which has been produced by the occurrence of the vortex, smoothly flowing along the single pivotable plate,
said single pivotable plate being rotatable from 45° to 90° so as to shift the vortex and to deflect the direction of the air current form 0° to almost 90°.

4,462,751

CENTRIFUGAL PUMP IMPROVEMENT

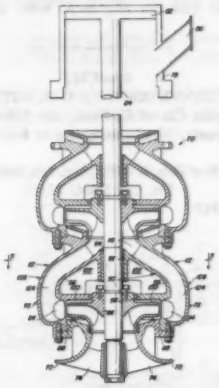
Wallace L. Smith, Fallbrook, and Randal S. Ferman, Monterey Park, both of Calif., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 24, 1982, Ser. No. 361,232

Int. Cl.³ F01D *29/44*

U.S. Cl. 415—89 **3 Claims**

1. A centrifugal pump assembly comprising:
a rotatably driven shaft;
means to drive said shaft;
a centrifugal impeller connected to said shaft for rotation therewith;
an inlet casting having a generally centrally located inlet passage communicating with said impeller;
a discharge casting having a discharge outlet communicating with said impeller;
a bowl casting surrounding said shaft and connected respectively to said inlet and said discharge castings;
an acorn formed integrally as part of said bowl casting; and
at least two integral and individual fluid diffuser passages each with walls joined to said acorn defining the exterior of said bowl casting and the exterior of said pump assembly;
said acorn also defining with said fluid passages walls the exterior of said bowl casting and the exterior of said pump assembly;



said passages permitting fluid flow from said impeller to said discharge outlet, the number of said passages being selected to provide the desired specific speed of said pump assembly.

4,462,752

IN-LINE CENTRIFUGAL PUMP

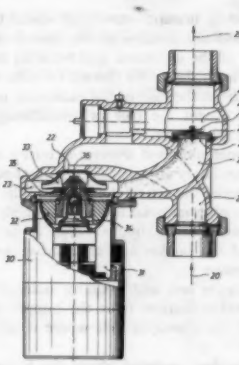
Karsten Laing, Kaiserallee 51, D 7500 Karlsruhe, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,100

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128305

Int. Cl.³ F04D *29/40*

U.S. Cl. 415—219 B **1 Claim**



1. A centrifugal pump adapted for use in vertically aligned piping where said pump has a housing, an impeller in said housing rotatable about a vertical axis of rotation and forming with said housing an inlet area and an outlet area, an inlet opening in said housing adjacent the top thereof communicating in one direction with said inlet area and in an opposite direction by an inlet line to an inlet flange, and an outlet opening in said housing adjacent the top thereof communicating in one direction with said outlet area and in an opposite direction by an outlet line to an outlet flange; characterized in that said inlet flange and said outlet flange are vertically aligned in a

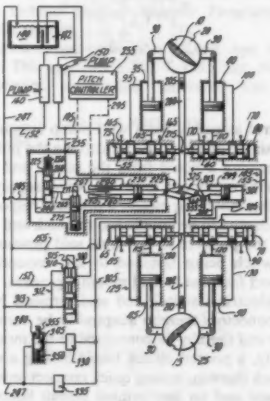
plane extending parallel to said axis of rotation with said inlet flange being below said outlet flange and are adapted to connect with vertically aligned piping and where said inlet line crosses said outlet line.

4,462,753

BLADE FEATHERING SYSTEM FOR WIND TURBINES

Kermit I. Harner, Windsor; John P. Patrick, South Windsor, and Kenneth F. Vosseller, Enfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 22, 1982, Ser. No. 391,016
Int. Cl.³ F03D 7/04
U.S. Cl. 416—48 4 Claims



1. In a blade feathering system for a wind turbine comprising at least one variable pitch blade movable to feathered position and an hydraulic feather actuator adapted to control the feathering of said blade, the improvement characterized by:

said feather actuator having a drain line connected thereto for draining hydraulic fluid therefrom;

a pair of flow controllers communicating with said drain line for controlling the rate of draining of said feather actuator and therefore, the rate of operation thereof; and

a pitch rate control valve operated by said feather actuator and in fluid communication with one of said flow controllers for selectively blocking flow therethrough in response to operation of said feather actuator for carrying out said blade feathering at a diminished rate.

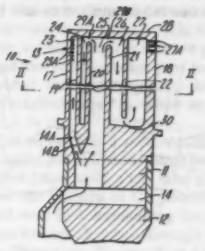
4,462,754

TURBINE BLADE FOR GAS TURBINE ENGINE

Peter R. Schofield, Bristol, England, assignor to Rolls Royce Limited, London, England

Filed Jun. 22, 1982, Ser. No. 390,959
Claims priority, application United Kingdom, Jun. 30, 1981, 8120164
Int. Cl.³ F01D 5/08
U.S. Cl. 416—97 R 2 Claims

1. An aerofoil turbine blade for gas turbine engines, comprising two opposite side walls, a leading edge wall, a trailing edge wall and first, second, third and fourth internal walls extending transversely between the side walls; a first spanwise passage defined between the leading edge wall and a first internal wall; a second, a third and a fourth passage defined in succession by said first internal wall and by said second, said third and said fourth internal walls and portions of said side walls; a first and third passages each having an inlet for a cooling air supply at one spanwise end of the blade, the third passage being interconnected with each of the second and fourth passages at the



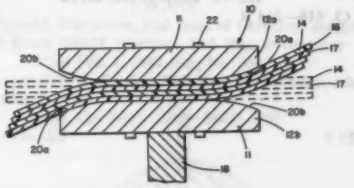
other spanwise end of the blade, and the first, second and fourth passages each having outlets to the exterior of the blade.

4,462,755

ANVIL-STRAP ROTOR

Peter C. Ogle, Woodbridge, and Edward S. Hibyan, Trumbull, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1981, Ser. No. 295,405
Int. Cl.³ B64C 27/38
U.S. Cl. 416—132 R 11 Claims



1. An aerodynamic rotor blade comprising a plurality of planar layers each of the layers having diametrically opposed planar surfaces, the planar layers being disposed in respective parallel planes with the respective outer planar surfaces being in slidable engagement with the corresponding outer planar surfaces of adjacent layers, the planar layers being slidably movable in a shearing motion with respect to the other layers upon the application of flexure forces acting upon the blade.

4,462,756

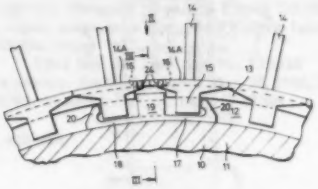
ROTOR FOR FLUID FLOW MACHINE

Simon D. Muggleworth, Bedfordshire, and Colin G. Sparrow, Bristol, both of England, assignors to Rolls Royce Limited, London, England

Filed Dec. 20, 1982, Ser. No. 451,187
Claims priority, application United Kingdom, Dec. 30, 1981, 8139036
Int. Cl.³ F01D 5/32
U.S. Cl. 416—215 12 Claims

1. A rotor assembly for a turbomachine comprising a rotor body having a circumferentially extending groove which is defined at least in part by two mutually confronting flanges, each of which has a surface facing substantially inwards, at least one of said flanges having a loading slot therein, a plurality of blades equispaced along said groove, each blade being retained in said groove by a complementary shaped root portion designed to engage the substantially inward facing surfaces of the two mutually confronting flanges, each root portion being shaped and dimensioned to enable said blade to be loaded into said groove through the loading slot and to be moved along said groove, and a filler member which locates in

the loading slot and comprises an elongated base portion extending circumferentially along said groove below the root of at least one of said blades, said base portion being provided with at least one recess for securing the root of one of the blades and at least one tab connected to said base portion and



extending outwardly therefrom, said tab being movable relative to said base portion between a first position in which said tab is clear of the loading slot and thereby allows said filler member to move along the groove and a second position in which said tab is located in the loading slot and so prevents said filler member from moving along said groove.

4,462,757

FAN BLADE STRUCTURE

Masakazu Uemura, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 30, 1982, Ser. No. 430,672
Claims priority, application Japan, Oct. 12, 1981, 56-162334
Int. Cl.³ F04D *29/32, 29/52*
U.S. Cl. 416—244 R **8 Claims**

1. A fan blade structure, comprising in combination

a unitary blade member comprising an annular boss portion having a cylindrical outer periphery surface and a plurality of blade portions integral with and radially projecting outwardly from the boss portion; and

a collar member secured to said blade member, the collar member comprising a frusto-conical outer wall portion coaxially surrounding the boss portion of the blade member and tapering toward the front end of the boss portion and an inner flange portion circumferentially extending along the boss portion of the blade member and securely attached to the rear end face of the boss portion of said blade member, said outer wall portion having a radially enlarged axial end and a radially reduced axial end and being formed with a plurality of slots which are angled and configured conformingly to radially inner end portions of said blade portions, respectively, of the blade member and which are open at the radially reduced axial end of the collar member,

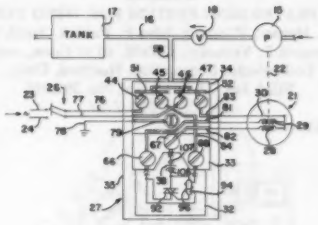
said blade member further comprising an inner flange portion circumferentially extending along the boss portion of the blade member, and said collar member further comprising an annular rear end portion radially intervening between the outer wall portion and the inner flange portion of the collar member and securely attached to the rear end face of the inner flange portion of the blade member.

4,462,758

WATER WELL PUMP CONTROL ASSEMBLY

Russell H. Speed, Fort Wayne, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Jan. 12, 1983, Ser. No. 457,423
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—38 **12 Claims**



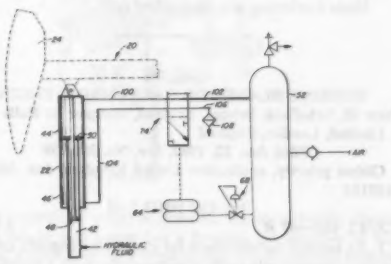
1. A control assembly for a well pump system, the system including a single phase motor for driving the pump, a storage tank for receiving a liquid from the pump, and power leads extending to the motor and to an AC power supply, said assembly comprising mounting means, a pressure responsive electrical switch adapted to be coupled to the tank and to operate in response to the pressure in the tank, said pressure responsive electrical switch being fastened to said mounting means, a terminal board fastened to said mounting means, said pressure responsive electrical switch and said terminal board having electrical connectors thereon adapted to be connected to the power leads and thereby be connected to the motor and to the power supply, a printed circuit board having a start winding control switch thereon, mating quick connect terminals on said terminal board and on said printed circuit board, said quick connect terminals being connected to said start winding control switch and to said electrical connectors for connecting said start winding control switch to the motor, and a cover enclosing said terminal board and said printed circuit board and said pressure responsive electrical switch.

4,462,759

OIL WELL PUMP SHUTDOWN SYSTEM

Ronald W. McGeehee, Redwood Valley, Calif., assignor to All American University, Incorporated, Upland, Calif.

Filed Dec. 30, 1981, Ser. No. 335,897
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—46 **10 Claims**



1. In an oil well pumping unit including a pump motor, a walking beam assembly driven by the pump motor, a rod string reciprocated by the beam assembly, and an air-balanced cylinder for storing energy from the beam during a portion of the pump cycle and returning energy to the beam during the remainder of the cycle, a shutdown system comprising:

means for mechanically sensing the load exerted by the rod string, said means having a force output proportional to said load;

means for applying a preselected force in opposition to the force output of the sensing means; and

means for detecting when said opposing force exceeds said output force and for stopping the operation of the pump motor and means for bleeding the air-balanced cylinder when such an event occurs so that motion of the walking beam will cease substantially immediately.

4,462,760

METHOD AND APPARATUS FOR METERING LIQUIDS

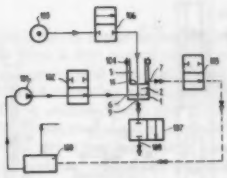
Tony R. Sarich, Karrinyup; Kenneth N. Johnsen, Greenwood, and Michael L. McKay, Mosman Park, all of Australia, assignors to Orbital Engine Company Proprietary Limited, Willeton, Australia

Continuation-in-part of Ser. No. 29,054, Apr. 11, 1979, abandoned. This application Jul. 7, 1981, Ser. No. 281,049

Claims priority, application Australia, Apr. 14, 1978, 45827/79

Int. Cl.³ F04F *1/06*

U.S. Cl. 417—54 **60 Claims**



1. Apparatus for delivering a metered quantity of fuel to an engine comprising:

a body having a chamber formed therein,

a fuel inlet port communicating with said chamber,

a first valve means in association with said fuel inlet port for permitting fuel to flow through said fuel inlet port into said chamber,

a fuel outlet port communicating with said chamber,

a second valve means in association with said fuel outlet port for permitting the discharge of fuel from said chamber when the chamber is filled with fuel between said fuel inlet port and said fuel outlet port, said first valve means and said second valve means cooperating when opened so that fuel completely fills said chamber between said fuel inlet port and said fuel outlet port with any residual gas being displaced from at least that portion of said chamber,

a gas inlet port communicating with said chamber,

a third valve means associated with said gas inlet port for permitting gas to flow through said port into said chamber,

a fuel discharge port communicating with said chamber,

a fourth valve means in association with said discharge port for permitting discharge of fuel from said chamber, said third valve means and said fourth valve means cooperating when opened and when said first and second valve means are closed so that upon opening of the third valve means gas passes through said gas inlet port into said chamber and displaces fuel between said gas inlet port and said fuel discharge port from said chamber through said fuel discharge port,

the opening and closing of said valve means being independent of any movement of said chamber,

control means for controlling the amount of fuel displaced from the chamber, upon a given cycle of gas injection into said chamber, by adjusting the relative positions of the gas inlet port and the fuel discharge port to vary the capacity of the chamber thereinbetween to thereby control the amount of fuel discharged from the apparatus in a given cycle.

2. A method of delivering a metered quantity of fuel for delivery to an engine, said method comprising circulating fuel through a chamber fitted with a gas inlet port and a fuel discharge port until the portion of the chamber lying between said ports is filled with fuel, terminating the circulation of fuel and admitting gas to said chamber through said gas inlet port at a pressure sufficient to displace fuel from the chamber, displacing fuel from the chamber by the admitted gas upon the selective opening of said fuel discharge port, with the opening and closing of the ports being independent of any movement of said chamber, and controlling the quantity of fuel displaceable in a given cycle of gas admission to said chamber by adjusting the relative positions of the gas inlet port and the fuel discharge port to vary the capacity of the chamber thereinbetween to thereby control the amount of fuel discharged from the apparatus in a given cycle.

4,462,761

PUMP, ESPECIALLY FOR PUMPING FUEL FROM A STORAGE TANK TO AN INTERNAL COMBUSTION ENGINE

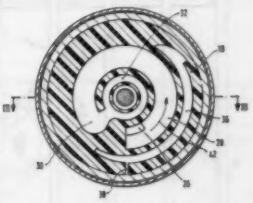
Peter Ringwald, Rutesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

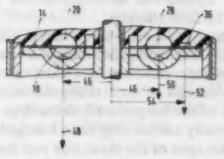
Filed Feb. 1, 1982, Ser. No. 344,773

Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118534

Int. Cl.³ F04B *23/14*; F04D *5/00*

U.S. Cl. 417—203 **7 Claims**





1. A pump, especially for use in pumping fuel from a storage tank to an internal combustion engine, comprising a support; an impeller wheel mounted on said support for rotation about an axis and having an axial end face and only one annulus of impeller vanes defining respective closed compartments therebetween which open onto said axial end face; means for rotating said impeller wheel about said axis for said impeller vanes to orbit said axis in an annular trajectory; an end wall station-

ary relative to said support and having an end surface facing said axial end face of said impeller wheel and defining an interface therewith, and only one pumping channel open onto said end surface and extending along a part of said annular trajectory to convey the medium being impelled by said annulus of said impeller vanes at a pressure which gradually increases in the downstream direction of said one pumping channel and exerts a tilting moment on said impeller wheel; and means for counteracting said tilting moment which is exerted by the medium impelled by said only one annulus of impeller vanes and conveyed by said only one pumping channel, said counteracting means being associated with said only one pumping channel, said counteracting means includes means for defining a pressure zone in said end wall which opens onto said interface, and means for supplying pressurized fluid to said pressure zone, the pressure of such pressurized fluid and the magnitude and location of said pressure zone being such that the pressurized fluid in said pressure zone exerts a counter moment on said impeller wheel which substantially counteracts said tilting moment.

4,462,762

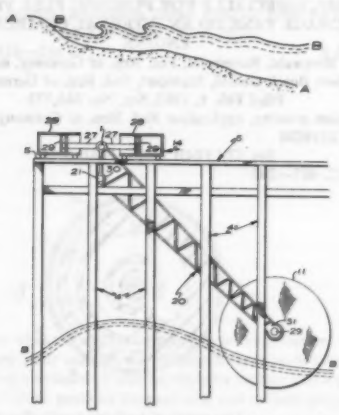
WAVE ACTION MACHINE

Narayanaswami Palani, Whitefield, Bangalore, India (560066)

Continuation of Ser. No. 123,252, Mar. 7, 1980, abandoned. This application May 6, 1982, Ser. No. 375,788

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—332 **1 Claim**



1. A wave action machine connected to a pier which projects into water and being operable for harnessing and storing energy produced by the action of waves, comprising:

a bouyant cylindrical float positioned in the water and adapted to float therein,

a pair of elongate spaced-apart substantially similar parallel arms, each arm being of triangular configuration having one short side and two long sides, means pivotally connecting one end of each triangular arm at approximately the apex of the longer sides thereof to said float,

means pivotally connecting each triangular arm at approximately the apex of the short side and one long side thereof to the pier to permit pivoting of the arm about a horizontal axis, said short side of each triangular arm extending between the pivotal connection of the arm with the pier and a pivotal connection of the arm with a horizontal shaft,

a plurality of pumps on said pier and each including a horizontal cylinder, a piston movable in the cylinder, a horizontal piston rod secured to the piston for movement therewith, each cylinder having an inlet and an outlet, means connecting the inlet of each pump to an elongate supply conduit for supplying of fluid to the cylinders,

means connecting the outlet of each pump to an outlet conduit, the latter being adapted to be connected to a storage structure whereby fluid compressed by the pumps will be directed to and stored in a storage structure,

certain of said pumps being arranged in opposed relation with respect to each other,

a horizontal shaft pivotally connected with the piston rods of said pumps,

means pivotally connecting the shaft with the other end of each of said arms at approximately the apex of the short side and the other long side thereof whereby said upward and downward movement of the float in response to wave action alternately produces compression and intake strokes of the pistons of said pumps, and when the piston of one pump is moving in a compression direction, the piston of another pump is moving in an intake direction.

4,462,763

HYDRAULIC PUMP JACK

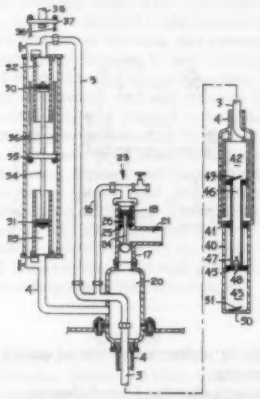
Donald I. MacLeod, 41 Phelps St., Geraldton, 6530, State of Western Australia, Australia

Filed May 25, 1982, Ser. No. 381,868

Claims priority, application Australia, Mar. 24, 1982, 3291/82

Int. Cl.³ F04B *47/08*

U.S. Cl. 417—378 **6 Claims**



1. A hydraulic pump jack for hydraulically actuated well pumps of the general type having pistons driven in one direction to lift liquid up a delivery pipe and having the pistons returned by liquid in a control pipe to recharge the said pump, characterised by a double-acting pump having a first pump section arranged to be coupled to the said liquid delivery pipe extending up the well, and a second pump section arranged to be coupled to the said pump control pipe which also extends up the well, fluid actuated valve means in the said delivery pipe to normally stop outflow from the said delivery pipe, and means coupling the said control pipe to the said valve means to actuate the said control valve to allow an outflow of liquid from the said delivery pipe when the said control pipe is pressurised during the pressure stroke of the said first pump section.

4,462,764

HYDRAULIC LONG STROKE PUMP

Hillard C. Van Zandt, 407 S. Grant, Odessa, Tex. 79763

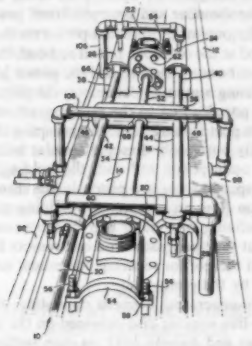
Filed Nov. 12, 1981, Ser. No. 320,577

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—401 **7 Claims**

1. A hydraulically powered long stroke pumping unit comprising support means including a base and at least first and second mounting means secured to said base and extending substantially normal thereto in relative spaced relationship, a

first pump unit removably mounted on said support means and including a first pump cylinder and first piston means reciprocable in said first pump cylinder, means removably securing a first end of said first pump cylinder to said first mounting means, said first piston means including a piston rod extending outwardly from said first end of said first pump cylinder, a second pump unit removably mounted on said support means in opposed aligned, spaced relationship with said first pump unit, said second pump unit including a second pump cylinder and second piston means reciprocable in said second pump



cylidner, said second piston means including a piston rod extending outwardly from a first end of second pump cylinder, means removably securing said first end of said second pump cylinder to said second mounting means, said first and second pump cylinders being mounted with the piston rods thereof extending toward one another along a common central longitudinal axis, a pump drive bar removably connected to the outermost ends of the piston rods of said first and second pump cylinders, and hydraulic drive means connected to selectively and positively drive said pump drive bar in opposite directions in a single plane.

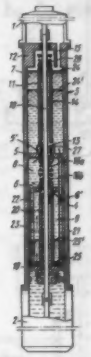
4,462,765

LIQUID-PROOFING SYSTEM FOR AN ELECTRIC MOTOR OF A DEEP-WELL PUMPING UNIT

Valentin V. Rodkin, ulitsa Dubki, 4, kv. 108; Anatoly A. Chudinovsky, ulitsa Musy Dzhalilya, 14, korpus 1, kv. 159, and Valentina V. Petrova, Chernomorsky bulvar, 7, korpus 2, kv. 81, all of, Moscow, U.S.S.R.

Filed Dec. 4, 1981, Ser. No. 327,457
Int. Cl.³ F04B *35/04;* H02K *5/12*
U.S. Cl. 417—414 **2 Claims**

1. In a deep-well pumping unit having an electric motor filled with an oil to provide a liquid dielectric and a pump for pumping a well fluid and interconnected with the motor by a shaft, a liquid-proofing system for said electric motor, comprising: a casing, two transverse partition walls dividing said casing into three coaxially arranged chambers—a top chamber, an intermediate chamber, and a bottom chamber, said top chamber being filled with an intermediate liquid having a specific gravity which is greater than the specific gravity of an oil filling the electric motor and the specific gravity of the well fluid, said intermediate liquid being immiscible with the oil and well fluid, said intermediate chamber being filled with an oil having a specific gravity corresponding to the specific gravity of the oil filling the electric motor, and said bottom chamber being filled with substantially the same oil as the oil in the intermediate chamber, and only a lower part of the bottom chamber being filled with the same intermediate liquid as the top chamber, openings provided in said two partition walls for the passage of said shaft interconnecting said electric motor and said pump, a first pipe for establishing communication between the intermediate chamber and a lower part of the bottom chamber, said first pipe being filled with the same oil as the intermediate chamber, a second pipe for establishing communication between the top chamber and the lower part of the bottom chamber, said second pipe being filled with the intermediate liquid, seals installed in the intermediate chamber and each having a rotary part and a stationary part, said seals being



designed for sealing portions where the shaft passes through the partition wall separating the intermediate chamber and the top chamber and the partition wall separating the intermediate chamber and the bottom chamber, the rotary parts of said seals being installed on the shaft and the stationary parts being installed in the partition walls.

4,462,766

DEVICE FOR AUTOMATIC CIRCULATION IN A WASTE WATER PUMP STATION

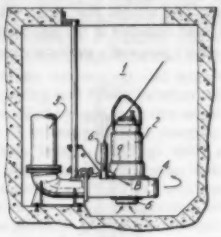
Valdemar Carlsson, Solna, and Balint Szendröi, Vällingby, both of Sweden, assignors to ITT Industries, Inc., New York, N.Y.

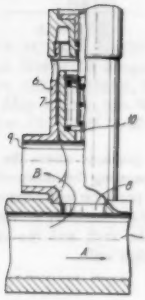
Filed Feb. 4, 1982, Ser. No. 345,837
Claims priority, application Sweden, Feb. 10, 1981, 8100902
Int. Cl.³ F04B *21/00*
U.S. Cl. 417—430 **5 Claims**

1. An arrangement for circulating a medium in a submersible pump assembly which includes a pump housing comprising:

a valve connected to the pump housing and communicating with the interior of the latter at a location outside the path of travel of any solid objects which may be entrained in the medium and having a passageway with an upstream portion oriented in a direction within 45° to either side of the direction directly opposite to the original direction of flow of the medium at said location so that the leading end portions of any flexible objects which may be entrained in

the medium, significant portions of which enter the valve, travel in a direction substantially opposite to the direction





of travel of the trailing end portions and are prevented from becoming wrapped around a surface at said location.

4,462,767

AIR PUMP

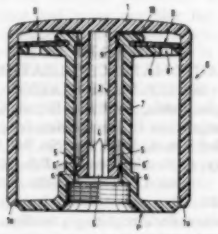
Dieter Dorsch, Heilbronn, Fed. Rep. of Germany, assignor to Günter Grittman, Uhlbach, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,236

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 8121571[U]

Int. Cl.³ F04B *19/02, 21/04*

U.S. Cl. 417—460 **5 Claims**



1. An air pump comprising

(a) a piston housing having an axis and including

(1) an inner wall extending about the axis,

(2) a top closure and

(3) an axially extending cylindrical post integrally molded on the top closure and having a free end remote therefrom,

(b) a piston assembly positioned within the piston housing for relative movement with respect to the top closure, the piston assembly including

(1) an axially extending cylindrical piston rod having two open ends, the piston housing post projecting into the cylindrical piston rod through one of the open ends facing the top closure and the piston rod being guided along the post with a slight clearance during the movement of the piston, the one open piston rod end defining an air outlet port, and a radially inwardly directed shoulder on the cylindrical piston rod constricting the air outlet port, the air outlet port being arranged between the shoulder and the cylindrical post,

(2) a radially outwardly directed piston on the cylindrical piston rod at the one open piston rod end, the piston, the top piston housing closure and the piston housing inner wall defining a pumping chamber, the piston having an air inlet port leading to the pumping chamber and the air outlet port leading from the pumping chamber,

(3) a radially outwardly directed annular holding plate at the one open piston rod end, the holding plate being slightly spaced from the piston in the direction of the top piston housing closure, the holding plate and the piston defining an annular gap therebetween, and

(4) means at the open piston rod end remote from the one open end thereof for securing equipment to be supplied with air by the pump, and

(c) a pressure-generating element consisting of a resilient, membrane-like annular disc centered on the piston in the annular gap and loosely held on one surface of piston facing the pumping chamber, the diameter of the disc being at least equal to the diameter of the piston whereby the disc bears against the inner piston housing wall and a sealing fit when the piston assembly is moved towards the top piston housing closure.

4,462,768

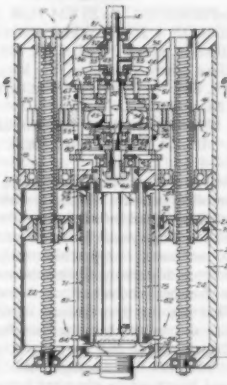
AIR COMPRESSOR

Julius C. Westmoreland, Marina Del Rey, Calif., assignor to Inotek-Westmoreland Venture, Irvine, Calif.

Filed Nov. 29, 1982, Ser. No. 445,160

Int. Cl.³ F04B *21/02, 39/08*

U.S. Cl. 417—518 **5 Claims**



1. An air compressor driven by a unidirectional rotational power source, comprising:

a hollow, generally cylindrical housing including a partition wall separating the interior into a first chamber in which air compression occurs and a second chamber, and first and second end walls enclosing the housing interior;

tubular means extending along the cylindrical axis from the partition to the end wall within the housing first chamber

and including first and second port means adjacent said partition and said end wall, respectively;

an annular piston located in said first chamber and slidingly received on the tubular means;

first and second shafts threadedly meshing with nut means on said piston, said shafts having portions extending into both the first and second chambers;

a drive gear mounted within the housing second chamber;

first and second gears affixed respectively to the first and second shafts and meshed with the drive gear;

alternating clutch means interrelating the rotational power source and the drive gear for consecutively driving the annular piston between two extreme points within the second chamber;

air valving means having a first mode interconnecting a source of ambient air to the first port means and the second port means to an outlet fitting in the housing, and a second mode interconnecting the source of ambient air to the second port means and the first port means to the outlet fitting; and

means driven by the annular piston for consecutively actuating the alternating clutch means and air valving means.

4,462,769

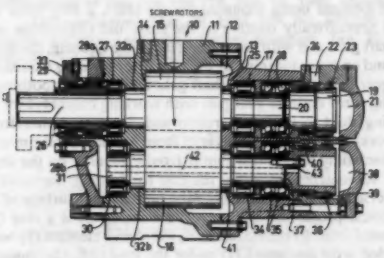
METHOD AT AN OIL-INJECTED SCREW-COMPRESSOR

(Lars) Lauritz B. Schibbye, Saltsjö-Dufnäs and Rolf A. Englund, Spanga, both of Sweden, assignors to Sullair Technology AB, Stockholm, Sweden

Filed Dec. 2, 1981, Ser. No. 326,602

Int. Cl.³ F04C *18/16, 29/02*

U.S. Cl. 418—1 9 Claims



1. A method at an oil-injected screw-compressor for balancing axial forces at at least one of the rotors of the compressor, for sealing the gaps between the rotor housing and the shafts of the rotors and for cooling and lubricating the bearings of the rotor shafts, where a rotor housing includes a compression space in the form of two rotor barrels defined by two intersecting bores with a low-pressure port at one end and a high-pressure port at the other end, and two meshing rotors, viz. a male rotor and a female rotor, mounted rotatably in the rotor barrels, which compressor is driven on the shaft of the male rotor on the high-pressure side, characterized in that at the high-pressure end of the compressor oil under pressure is supplied to bearing spaces at the ends of both rotors, that an oil flow inward to the compression space along the gaps between the rotor shafts and the rotor housing is obtained for sealing against leakage from the compression space, and that oil is supplied via a connection from the bearing space of the female rotor to a pressure space at the low-pressure end of the female rotor for balancing the axial force arising on the shaft end of the female rotor on the high-pressure side due to the oil supplied to the bearing space of the female rotor.

4,462,770

GEAR PUMP WITH ROTATABLE SECTIONS

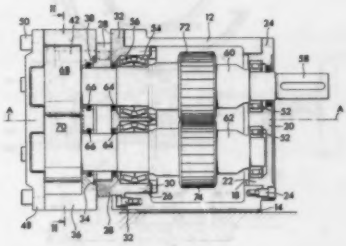
Fritz Haupt, Regensdorf, Switzerland, assignor to Maag Gear Wheel & Machine Company Limited, Zürich, Switzerland

Filed Jan. 31, 1983, Ser. No. 462,428

Claims priority, application Switzerland, Feb. 19, 1982, 1037/82

Int. Cl.³ F01C *1/18*

U.S. Cl. 418—39 5 Claims



1. A gear pump comprising

a pump housing having a pump inlet and a pump outlet;

two meshing pumping gear wheels enclosed by said pump housing;

a transmission housing including a base arrangement;

two meshing auxiliary gear wheels enclosed in said transmission housing;

said pump housing and said transmission housing defining a common primary axis;

an end bearing plate disposed on a side of said transmission housing which is remote from said pump housing;

an intermediate bearing plate disposed intermediate said pump housing and said transmission housing;

said end bearing plate and said intermediate bearing plate as well as said transmission housing being structured to be mounted to each other in at least two relative rotational positions rotated with respect to one another by a substantially uniform angle relative to said primary axis;

said pump housing and said intermediate bearing plate being structured to be mounted to each other in two relative rotational positions rotated with respect to one another by an angle of approximately 180° about said primary axis;

two shafts arranged symmetrically in respect of said primary axis and rotatably journaled in said end bearing plate and in said intermediate bearing plate, one of said shafts forming a driving shaft;

each of said two shafts carrying one of said two pumping gear wheels and one of said two auxiliary gear wheels; and

an outwardly protruding drive stud provided at said driving shaft.

4,462,771

WRAP ELEMENT AND TIP SEAL FOR USE IN FLUID APPARATUS OF THE SCROLL TYPE AND METHOD FOR MAKING SAME

Arlo F. Teegarden, Stoddard, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Feb. 9, 1981, Ser. No. 232,527

Int. Cl.³ F01C *1/02, 19/08;* B23P *15/06;* F16J *9/04*

U.S. Cl. 418—55 22 Claims

1. A tip seal for use in fluid apparatus of the scroll type comprising a relatively rigid strip of material having been wound about its longitudinal axis into a generally spiroidal configuration about a reference axis and having a cross section taken in a plane substantially perpendicular to its longitudinal axis wherein at least the radially outer surface thereof in convex in a radially outward direction, constructed in accordance

with the method comprising winding said strip of relatively rigid material into said generally spiroidal configuration about

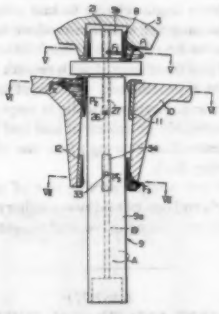
a reference axis in an operation in which the strip of material is subject to a degree of twist about its longitudinal axis.

4,462,772

OIL FEEDING DEVICE FOR SCROLL FLUID APPARATUS

Eiichi Hazaki, Shimizu; Masaya Imai, Ibaraki; Kenji Tojo, and Masao Shiibayashi, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 27, 1981, Ser. No. 315,495
Claims priority, application Japan, Oct. 31, 1980, 55/152077
Int. Cl.³ F01C *1/02, 21/02, 21/04;* F01M *1/06*
U.S. Cl. 418—55 9 Claims



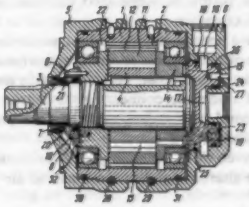
1. An oil feeding device for a scroll fluid apparatus including a fixed scroll member, an orbiting scroll member, a crankshaft having a crank portion connected to said orbiting scroll member through a first plain bearing and a shaft portion carried by second and third plain bearings, the oil feeding device including an oil feeding means for generating an oil film pressure in each bearing in dependence upon a lateral load caused by sealed spaces defined by the fixed and orbiting scroll members so as to reduce a tilting of the crankshaft during operation of the apparatus, the said oil feeding means including a plurality of oil flow passage means respectively facing said first, second and third plain bearings and being disposed about an outer peripheral surface of said crankshaft.

4,462,773

PLANETARY HYDRAULIC MOTOR

Fedor N. Erasov, ulitsa Solnechnaya, 7/9, kv. 77; Viktor K. Levitsky, ulitsa Koroleva, 22, kv. 141, and Sergei V. Skripkin, ulitsa Vishnevskogo, 11, kv. 51, all of Odessa, U.S.S.R.

PCT No. PCT/SU81/00068, 371 Date May 13, 1982, 102(e) Date May 13, 1982, PCT Pub. No. WO82/01030, PCT Pub. Date Apr. 1, 1982
PCT Filed Aug. 21, 1981, Ser. No. 380,726
Claims priority, application U.S.S.R., Sep. 19, 1980, 2985013
Int. Cl.³ F03C *2/08*
U.S. Cl. 418—61 B 1 Claim



1. A planetary hydraulic motor comprising a housing with a stator gear one side of which is covered by a cup intended for fixing the planetary hydraulic motor in working position, the other side thereof being covered by a cup for feeding the motor with a working fluid, a shaft arranged inside the housing and having rigidly secured thereon a gear, a sealing element of the shaft in the form of a thrust ring secured in the cup for fixing the planetary hydraulic motor in working position, a sleeve element having a cylindrical projection adjoining by an end face thereof the working surface of the thrust ring, the sleeve element being mounted on the shaft, a ring rotor disposed eccentrically relative to the shaft and engageable with the shaft gear and with the stator gear of the housing, the stator gear and an outer toothing of the ring rotor forming a transmission gear pair, whereas the shaft gear and an inner toothing of the ring rotor define a gear pair with working chambers for the working fluid to be fed thereinto and discharged therefrom, the working fluid being delivered from a fluid valving mechanism including a fluid distributor fixedly secured on the shaft, and a valve arranged inside the cup for feeding the working fluid, characterized in that mounted on the outer surface of the cylindrical projection of the sleeve element (8) is a ring (20) fabricated from an elastic material, the sleeve element (8) being provided with passages (21) under the ring (20), the passages (21) being adapted to communicate a section of the inner surface of the ring (20) with the atmosphere.

4,462,774

ROTARY EXPANDER FLUID PRESSURE DEVICE

William Hotine, 633 Ramona Ave., #23, and John A. Ziegler, 1180 Bayview Hts. Dr., both of Los Osos, Calif. 93402

Filed Sep. 27, 1982, Ser. No. 425,067
Int. Cl.³ F04C *2/00*
U.S. Cl. 418—61 B 7 Claims

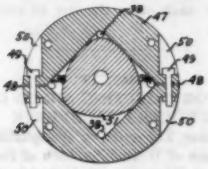
1. An improved fluid pressure device, said improvement comprising:

a rotatable working member with flat sides and with a periphery having six arcuate adjoining surfaces, the plane of each said arcuate surface describing a true circular arc having a radius centered on a vertex of an equilateral triangle;

a working chamber with flat sides and with a rigid square perimeter, each side of said square perimeter being dimensionally equal to the sum of the two radii of opposite arcs of said working member periphery;

a body provided with ducts for flow of working fluid to and from ports in corners of said working chamber;

drive means rotatably supported in said body;
coupling means for transmitting torque between said working member and said drive means; and



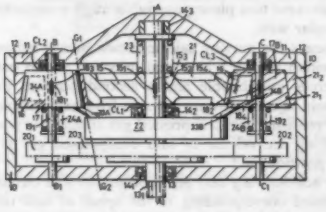
valve means in said body, said valve means coupled to said drive means and cooperable with said ducts to control fluid flow whereby fluid flow in said ducts is coincident with rotation of said drive means.

4,462,775

ROTARY PISTON MACHINE WITH MATING FRUSTOCONICAL SEALING SURFACE

Ronald C. N. Whitehouse, 34c Netherhall Gardens, London, N.W.3, England

Continuation of Ser. No. 160,779, Jun. 18, 1980, abandoned. This application Mar. 29, 1983, Ser. No. 480,036
Claims priority, application United Kingdom, Jun. 22, 1979, 21762/79; Jul. 13, 1979, 24448/79
Int. Cl.³ F01C *1/08, 19/00, 21/08, 21/10*
U.S. Cl. 418—107 **7 Claims**



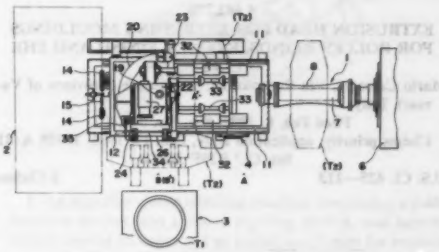
1. A rotary piston machine comprising a housing having an annular chamber, shaft means carrying a rotary piston member for continuous rotation about an axis of said annular chamber when the machine is in operation, means mechanically linking said piston member to a rotary obturator means rotatably received in a sealing chamber for rotation about an axis substantially parallel to said axis of rotation of said piston member, said rotary obturator means having a recess into which a part of the piston member enters during rotation to provide a working section in said annular chamber as a working fluid is fed to said piston member, said piston member having a frusto-conical peripheral surface that seals against a frusto-conical mating surface of the annular chamber, and biasing means maintaining said two frustoconical surfaces in sealing contact, said biasing means exerting a force that is directed along an axis of a right cone common to both said frusto-conical surfaces, said cone axis being the axis of rotation of said rotary piston member.

4,462,776

TIRE WITHDRAWAL ARRANGEMENT

Mitsuru Fujimoto, Shirakawa; Hisashi Imai, Fukushima, and Takashi Matumoto, Shirakawa, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jun. 29, 1982, Ser. No. 393,340
Claims priority, application Japan, Jun. 30, 1981, 56-103608
Int. Cl.³ B29H *5/02*
U.S. Cl. 425—31 **3 Claims**



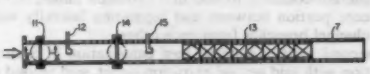
1. A tire withdrawal and transfer configuration for at least one tire shaping-former which comprises in combination:
a platform car for conveying said tire;
a rotatable support means provided on said platform car;
means for withdrawing said tire from said tire shaping-former mounted on said rotatable support means, said withdrawing means comprising tire support arms, including elevation means and rocking means, movable upward and downward with respect to said platform car;
means for actuating said elevation means of said withdrawal means so as to raise and lower said tire support arms so as to remove said tire from said tire shaping-former;
means for actuating said rotatable support means for positioning said tire for delivery via said platform car to a second tire shaping-former or a conveyor means; and
means for actuating said rocking means for delivery of said tire to said conveyor means through a rocking motion of said tire support arms.

4,462,777

BLOW-MOULDING MACHINE

Teishiro Watanabe; Makoto Tsunoi; Toshio Kai; Hiroshi Shiota; Hiroshi Nakabayashi; Tadayoshi Tsutsumi, and Ryuichi Sakai, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,551
Claims priority, application Japan, Apr. 21, 1981, 56-56526[U]; Apr. 22, 1981, 56-59691; Apr. 24, 1981, 56-61477
Int. Cl.³ B22C *15/24*
U.S. Cl. 425—87 **2 Claims**



2. A blow-moulding apparatus comprising:
a tank means for transporting refractory particles,
a booster provided subsequently to said tank,
a first air inlet means for pressurizing the interior of the tank,
a blast hose connected at one end to the booster,
a second air inlet means, arranged in the booster, for coating an inner wall surface of the blast hose with an air wall,
a spray gun mounted at the other end of said blast hose, and
a plurality of nozzles opening in the tangential direction of the cylindrical surface in the inner wall of said booster so that the refractory particles and the air can be driven into

revolving motion through the blast hose and the spray gun,

wherein said spray gun is provided with a first turbulence stimulating plate, a nozzle means for injecting hardener and/or hardening accelerator, a second turbulence stimulating plate, a nozzle means for injecting a binder, and a static mixer, arranged successively therein;

whereby adhesion of refractory particles onto the inner wall surface of the blast hose is prevented.

4,462,778

EXTRUSION HEAD FOR EXTRUDING MOULDINGS FOR ROLLER BLINDS, FRAMES, FINISH AND THE LIKE

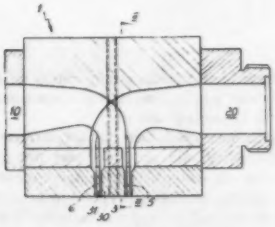
Mario Calcagni, Via Roccolo, 24, Morazzone (Province of Varese), Italy

Filed Feb. 8, 1982, Ser. No. 346,807

Claims priority, application Italy, Feb. 19, 1981, 19858 A/81

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—113 **3 Claims**



1. An extrusion head for extruding mouldings for roller blinds, standing finish and the like, comprising:

at least one metal section feeding aperture defining an axis of the extrusion head;

a first closed contour extrusion outlet coaxial with, and located externally of, said aperture;

a second closed contour extrusion outlet coaxial with said aperture and said first outlet and arranged externally of said first extrusion outlet spaced apart therefrom:

a first plastics material feed canalization in communication with said first extrusion outlet, said first canalization having an inlet length substantially perpendicular to said feeding aperture and defining a median plane substantially parallel to said axis, an intermediate length comprising two spaced apart channel branches of substantially elongated configuration in cross-section and arranged parallel to each other and to said median plane at two opposite sides thereof and spaced from said aperture, said channel branches opening with one end thereof into said inlet length and with another end thereof into said first extrusion outlet and having an elbow-like arcuate bend in an intermediate zone thereof thereby to direct said other end thereof coaxially to said first extrusion outlet;

a core portion between and separating laterally said two channel branches from each other;

a second plastics material feed canalization in communication with said second extrusion outlet, said second canalization having an input length substantially perpendicular to said feeding aperture and extending in said median plane in a juxtaposed position with respect to said inlet length, an intermediate extension of said second canalization comprising two spaced apart duct branches of substantially elongated configuration in cross-section and arranged parallel to each other and to said median plane externally to, and at two opposite sides of, said channel branches, said duct branches opening with one end thereof into said input length and with another end thereof into said second extrusion outlet and having an elbow-like arcuate bend in an intermediate zone thereof thereby to direct said other end thereof coaxially to said second extrusion outlet, the duct and the channel branches arranged at a same side with respect to said median plane defining between each other a respective intermediate body portion separating laterally said duct and channel branches from each other thereby to avoid interference therebetween.

4,462,779

APPARATUS FOR INJECTING AIR OR GAS INTO A TUBULAR FILM BUBBLE

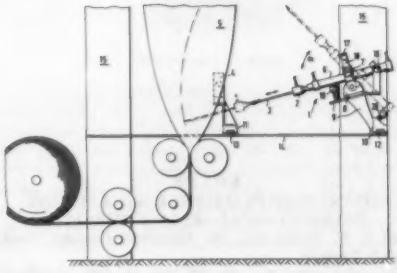
Friedhelm Brinkmeier, Lengerich of Westphalia, and Heinrich Frommeyer, Hagen of Westphalia, both of Fed. Rep. of Germany, assignors to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed May 11, 1982, Ser. No. 377,058

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3119006

Int. Cl.³ B29D *7/24*

U.S. Cl. 425—140 **12 Claims**



1. Apparatus for injecting a compressed gas, by an injection needle, into a bubble formed by squeeze rollers in a moving web of tubular film, said apparatus comprising:

an injection means adapted for injection of a compressed gas into said bubble, said injection means is pivotable about an axis transverse to a plane passing through a centerline of said tubular web;

moving means for moving said injection means between a first position during which said injection means extends and pierces said bubble and a second position during which said injection means retracts from said bubble;

means for releasing said compressed gas at said first position and halting the release of said compressed gas at said second position; and

means for accelerating said injection means to a circumferential speed corresponding to the speed of said tubular film.

4,462,780

INJECTION MOLDING APPARATUS

David Stavitsky, Plainsboro, and Ernest A. Beres, Robbinsville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 17, 1982, Ser. No. 450,770

Int. Cl.³ B29F *1/00*

U.S. Cl. 425—144 **10 Claims**

1. Apparatus for injection molding an article comprising:

a pair of mold members at least one of which is movable toward and away from the other, each of said mold members including

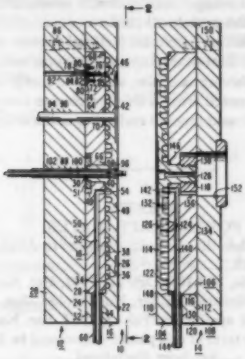
a base plate having inner and outer surfaces with the inner surfaces of the base plates facing each other,

mating mold cavities in the inner surfaces of the base plates,

a channel in the outer surface of each of the base plates,

a separate manifold plate mounted on the outer surface of each of the base plates, each of said manifold plates having

inlet and outlet passages extending therethrough and connected to the channel in its respective base plate, and



means holding each of the manifold plates against its respective base plate but allowing relative lateral movement between the manifold plates and the base plates.

4,462,781

APPARATUS FOR FEEDING AND POSITIONING CLAY BLANKS AND MOLDING BRICKS THEREFROM

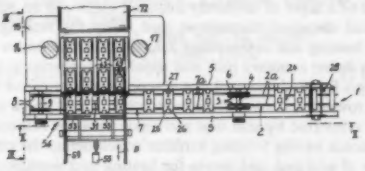
Rodiero Alieri, Via Liverani, 7, Imola, Bologna, Italy

Continuation of Ser. No. 055,678, Jul. 9, 1979, abandoned. This application Jul. 7, 1982, Ser. No. 395,873

Claims priority, application Italy, Jul. 10, 1978, 3491 A/78

Int. Cl.³ B28B *17/00*

U.S. Cl. 425—145 **5 Claims**



1. An apparatus for feeding and positioning clay blanks into mold cavities of a press for molding bricks from said clay blanks comprising a transporting conveyor for the clay blanks having a conveyor portion laterally arranged in front of said mold cavities at a distance therefrom, lifter plates arranged along said conveyor portion and adapted for raising a predetermined number of clay blanks from a laying position thereof on said conveyor portion to a position thereof above said conveyor portion, a platform arranged between said conveyor portion and said mold cavities and vertically movable between a position of substantial coplanarity with said lifter plates when the latter have raised the clay blanks from the conveyor and a raised position, pusher means for transfering the clay blanks from said lifter plates onto said platform when the lifter plates and the platform are in said coplanarity position, positioning means for adjusting the position of the clay blanks on said platform for alignment with the mold cavities, gripping means movable between a position overlaying said platform in which they grip said clay blanks after said adjusting positioning thereof and a position overlaying said mold cavities in which the gripped clay blanks are dropped into said mold cavities and punch means for molding bricks from said clay blanks in said mold cavities.

4,462,782

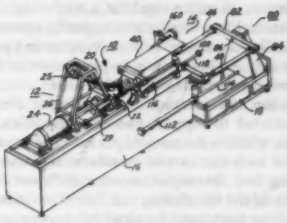
INJECTION SLEEVE MOLDING MACHINE

Charles W. Koser, Syracuse, Ind., assignor to T & M Rubber, Inc., Goshen, Ind.

Filed Nov. 8, 1982, Ser. No. 439,796

Int. Cl.³ B29D *23/02*

U.S. Cl. 425—183 **27 Claims**



1. An injection sleeve molding machine comprising a rubber injection section, and a sleeve molding section, said injection section having an auger and an injection cylinder for receiving uncured rubber material from said auger and for injecting the material into the molding section, said sleeve molding section including an elongated barrel having fixed forward and rearward end sections and a mold cavity for receiving uncured material from the cylinder of said injection section, two spaced elongated mandrels having a forward end and a rearward end for insertion axially into the cavity of said barrel, a centering means on said mandrels at said forward and rearward ends engaging said end sections for centering and holding said mandrels in centered position in said cavity during the molding operation, a pivoted member connected to said mandrels at their rearward end, a carriage for moving said mandrels into and from the cavity in said barrel, pivot means for rotating said pivoted member to shift said mandrels between a position for insertion into said cavity and a position remote therefrom for stripping molded sleeves from the mandrels, and means for moving said carriage, pivoted member and mandrels toward and away from said barrel.

4,462,783

MECHANISM FOR EXCHANGING MOLDING DIES IN AN INJECTION MOLDING MACHINE

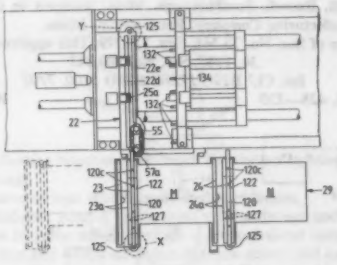
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Jun. 20, 1983, Ser. No. 506,025

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222743; Nov. 13, 1982, 3242169

Int. Cl.³ B29C *1/00*; B29F *1/00*

U.S. Cl. 425—183 **17 Claims**



1. In an injection molding machine which has a machine base carrying a horizontally oriented die closing unit with a stationary die carrier member, a movable die carrier member, and a

drive assembly producing horizontal die opening and die closing movements along the longitudinal center axis of the die closing unit, and wherein the stationary and movable die carrier members have parallel vertical die mounting faces and include means for releasably clamping to said die mounting faces the two halves of a succession of different injection molding dies which, for this purpose, are equipped with standardized oversize back plates which are engageable by said clamping means; in such a machine, a mechanism for exchanging injection molding dies by mechanically removing the previously installed die assembly from its operating position in the die closing unit and inserting in its place another die assembly, the mechanism comprising in combination:

a translation table arranged alongside the die closing unit and adapted to support two die assemblies at the same level at which a die assembly is held in operating position by said two die carrier members, the translation table defining two die emplacements equidistant from the center axis of the die closing unit, the translation table being guided for horizontal longitudinal movements parallel to said center axis, over a distance corresponding to the longitudinal spacing between said die emplacements, so that, in each end position of the translation table, one die emplacement coincides with a transfer position in which the back plate of a stationary die half in said die emplacement is substantially aligned with the mounting face of the stationary die carrier member;

a translation drive connected to the translation table for the creation of said longitudinal movements of the translation table;

means defined by each of the two die emplacements on the translation table for guiding a die assembly for horizontal transfer movements at right angles to the center axis;

means defined by the stationary and movable die carrier members for supporting a die assembly in its operating position, after release from the mounting faces of said members, and for guiding said die assembly for horizontal transfer movements at right angles to the center axis; and

a transfer drive engageable with a die assembly in a die emplacement of the translation table which is coincident with the transfer position, so as to entrain said die assembly in a positively controlled transfer movement between the transfer position and the operating position; and wherein

each die emplacement has its guide means so arranged that, in the transfer position, it cooperates with the support and guide means of the two die carrier members to define a substantially continuous straight-line transfer path for the die assembly between the transfer position and the operating position.

4,462,784

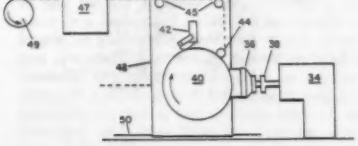
APPARATUS FOR CONTINUOUS MOLDING

David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 73,341, Sep. 7, 1979. This application Oct. 24, 1980, Ser. No. 200,343

Int. Cl.³ B29C *17/10;* **B29D** *5/00, 7/02*

U.S. Cl. 425—223 **10 Claims**



1. Apparatus for continuous molding comprising:

(a) a rotatable molding wheel having cavities in a peripheral surface thereof;

(b) a manifold having a surface that is substantially complementary to the peripheral surface of said molding wheel for the application of plastic material thereto with a layer of controlled film overlying said cavities; and

(c) a knife for skiving said film, said knife comprising at least one blade tapered from a thicker section toward at least one end, with said tapered end being deflected toward said wheel.

4,462,785

FORMING APPARATUS

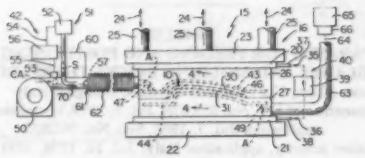
Carl M. Smith, Oakville, Canada, assignor to Allen Industries, Inc., Troy, Mich.

Division of Ser. No. 313,106, Oct. 20, 1981, Pat. No. 4,379,101, which is a continuation of Ser. No. 156,437, Jun. 4, 1980, abandoned. This application Feb. 2, 1983, Ser. No. 463,218

The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.

Int. Cl.³ B29J *5/00*

U.S. Cl. 425—387.1 **8 Claims**



1. In an apparatus for forming a fibrous workpiece comprised of a layer of randomly disposed fibers and an adhesive material dispersed throughout said fibers for binding same upon heating and compressing said fibers and adhesive material to define a unitary pad; said apparatus comprising; a press having a first and a second platen supported for relative movement toward and away from each other; a first and a second mold supported by said first and second platens respectively; said molds having forming surfaces which define the configuration of said pad; and means for heating said workpiece; the improvement in which said heating means comprises, means for mixing ambient air and superheated steam comprising a control system which controls a control device for said steam and a control device for said ambient air to thereby provide hot humid air, said control device for said ambient air being adapted to operate independently of said control device for said steam, and means for providing said hot humid air through said workpiece to provide a rapid penetration by said hot humid air and improved heating of said fibers and adhesive material enabling comparatively high speed forming of said pad with a minimum forming pressure, said means for providing hot humid air through said workpiece comprising, a first and second air manifold in said first and second molds respectively, a plurality of air passages communicating with an associated manifold and each air passage terminating in an aperture in an associated forming surface, a first conduit in flow communication with said first manifold for supplying said hot humid air to said first manifold, and a second conduit communicating with said second manifold for receiving said air after passage thereof through said manifolds and workpiece, an air blower for supplying ambient air into said first conduit at a controlled volume and pressure, and means for supplying a controlled volume of superheated steam into said first conduit, said control device being adapted to purge said manifolds and said passages of water vapor and to cool said workpiece after said hot humid air has been provided through said workpiece.

4,462,786

THERMOFORMING APPARATUS

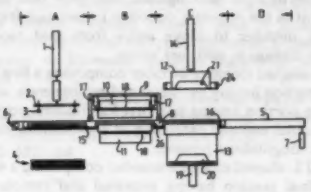
Leslie M. Perryman, Huntingdon, England, assignor to M. L. Shelley & Partners Limited, Cambridgeshire, England

Filed Aug. 13, 1982, Ser. No. 408,672

Claims priority, application European Pat. Off., Apr. 13, 1982, 82301900

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—388 **12 Claims**



1. Thermoforming apparatus of the kind having a heating station and a forming station wherein at the heating station there are provided upper and lower heaters for softening the thermoplastics sheet material, means for moving one of said heaters between the heating and forming stations, and means on the movable heater for gripping the plastics sheet along substantially the whole of its periphery whereby the movable heater is arranged to convey heated sheets from the heating station to the forming station while preventing shrinkage of the sheet.

4,462,787

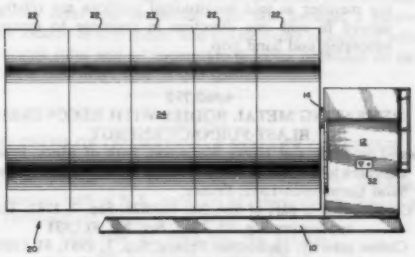
CANTILEVERED MANDREL ASSEMBLY

Carl R. Bogardus, Jr., 3224 Lamp Post La., Oklahoma City, Okla. 73120, and Lawrence C. Thompson, 6708 NW. 27 St., Bethany, Okla. 73008

Filed Feb. 1, 1983, Ser. No. 462,987

Int. Cl.³ B29C *13/04*

U.S. Cl. 425—402 **12 Claims**



1. A rotatable mandrel for forming cylindrically shaped moulded articles and a support therefor comprising:

(a) a base frame,

(b) a vertical support tower having upper and lower end portions, said lower end portion being secured to said base frame,

(c) a cantilevered shaft rotatably positioned within said upper end portion of said vertical support tower and extending horizontally outwardly in a direction parallel to and above said base frame,

(d) a collapsible rigid-walled cylindrical mandrel mounted on and rotatable with the cantilevered shaft,

(e) bearing means at the upper end portion of the vertical support tower for receiving the support end of said cantilevered shaft and transmitting the weight of said collapsible mandrel supported thereon through said vertical support tower to said base frame,

(f) means for imparting rotation to said cantilevered shaft and to said collapsible mandrel positioned thereon,

(g) the mandrel having a smooth outer circumferential surface formed by two opposed rigid arcuate support cylinder half sections hinged along one of their common longitudinal edges, and a narrow elongated arcuate pivoted door section bridging a longitudinally extending gap between the other edges of the half sections and pivotally connected to at least one of the spaced free edges of the half sections so as to swing radially inward whereby the half sections can move toward each other to reduce the diameter of the circumferential surface and permit removal of the molded article,

(h) power means for collapsing and expanding said collapsible mandrel sections whereby removal of the molded article formed thereon is facilitated and subsequently reexpanded to the full circumferential length with a high degree of reproducability each time the mandrel is operated.

4,462,788

METHOD FOR USING ALCOHOL TO REDUCE NITROGEN OXIDES IN A FUEL GAS

Edward A. Danko, Rolling Hills, Calif., assignor to Southern California Edison, Rosemead, Calif.

Filed Aug. 1, 1983, Ser. No. 519,330

Int. Cl.³ F23M *3/02*

U.S. Cl. 431—8 **14 Claims**

1. A method for reducing nitrogen oxide emissions from burning a fuel containing essentially no nitrogen comprising the steps of:

(a) burning a fuel containing essentially no nitrogen in a first burner means; and

(b) burning alcohol simultaneously in a second burner means, the second burner means being positioned above the first burner means so that the combustion gases from burning the fuel containing essentially no nitrogen pass through the combustion zone of the second burner means.

4,462,789

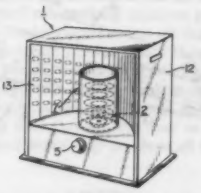
HEATING APPARATUS WITH DECORATIVE LIGHT EFFECT

Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Nov. 25, 1981, Ser. No. 324,869

Int. Cl.³ F21V *7/22*

U.S. Cl. 431—126 **6 Claims**



1. A heating apparatus having a decorative lighting effect comprising:

A source of heat which emits visible radiation;

a cylindrical tube of transparent or translucent and highly heat resistive material which is located about said source of heat and which extends a distance above said source of heat, at least the inner surface of said cylindrical tube being coated with a layer of metal or a metallic compound 0.1 microns–0.5 microns thick;

whereby the combination of said cylindrical tube and said source of heat, when viewed from above at an angle other

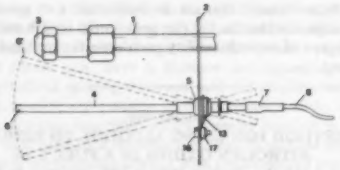
than 90 degrees, presents a plurality of images of the source of heat, the images being of various colors and at different apparent locations above the source of heat.

4,462,790

ELECTRODE ARRANGEMENT FOR AN OIL OR GAS BURNER

Borge B. Hansen, Augustenborg, and Ove S. Boe, Sonderborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Oct. 25, 1982, Ser. No. 436,288
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1981, 3143432
Int. Cl.³ F23Q *3/00*
U.S. Cl. 431—264 **6 Claims**



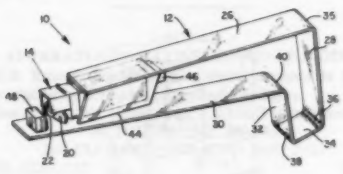
1. An electrode arrangement in an oil or gas burner, comprising a support plate, having a hole, a nozzle unit having a nozzle for directing fuel to burned to a region adjacent to said plate, an electrode rod holder having cylindrical end portions and a spherical intermediate portion, one of said cylindrical end portions extending through said hole in said support plate and the spherical portion being of larger diameter than said hold in said support plate, said holder having a bore extending therethrough, and an electrode rod extending through said bore, and having a front end forwardly of the support plate an holder, and a rear end rearwardly of the support plate and holder, and spring means mounted on said support plate for pressing said spherical portion into said hole and retaining the holder in selected adjusted pivoted positions.

4,462,791

FIRE LIGHTER

Richard Hayden, 1459 James St., SE., Marietta, Ga. 30060

Filed Aug. 30, 1982, Ser. No. 412,528
Int. Cl.³ F23D *13/24*
U.S. Cl. 431—345 **3 Claims**



1. A holder for a lighter of the type having a separate rotatable flint striker and a movable fuel valve, said holder comprising:

a first L-shaped elongate member;

means for removably mounting said lighter adjacent the remote end of said first elongate member;

a second L-shaped elongate member spaced apart from said first elongate member and in proximately parallel relation thereto, with said mounting means facing toward said second elongate member;

a frictional engaging member mounted on said second elongate member adjacent the remote end thereof, facing said mounting means in position to engage the flint striker and fuel valve of a lighter held in said mounting means; and

connecting means for movably mounting said second elongate member with respect to said first elongate member such that movement of said second elongate member in one direction relative to a parallel portion of said first elongate member causes said frictional engaging member to move toward said mounting means for said lighter so as to consecutively rotate said flint striker and engage said fuel valve to light said lighter, and such that relative movement in the opposite direction causes said frictional engaging member to move away from said mounting means to disengage said fuel valve;

said first L-shaped elongate member comprising a first longitudinal portion having proximal and remote ends, and has a first leg portion joining said first longitudinal portion at said proximal end and extending at a substantial angle to said first longitudinal portion;

said second L-shaped elongate member comprising a second longitudinal portion having proximal and remote locations, and has a second leg portion joining said second longitudinal portion at said proximal end and extending at a substantial angle to said second longitudinal portion;

said first and second leg portions having outer ends interconnected by said connecting mounting means to dispose said leg portions in mutually spaced apart and proximately parallel confronting relationship, said first and second leg portions providing a manually squeezable hand grip;

said first leg portion being longer than said second leg portion so as to dispose the proximal end of said first elongate member spaced above said proximal location of said second elongate member, so that squeezing and releasing said leg portions causes mutual reciprocal movement of said longitudinal portions;

said frictional engaging member being mounted adjacent said remote end of said second longitudinal portion to confront said remote end of said first longitudinal portion; and

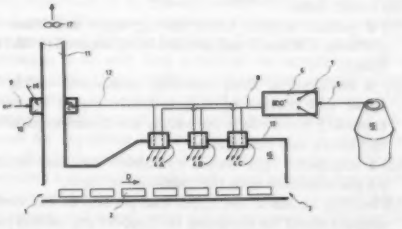
said lighter mounting means being mounted adjacent said remote end of said first longitudinal portion so that the lighter is mounted between said mutually spaced apart longitudinal portions in position for said flint striker and fuel valve to consecutively engage said frictional engaging member as said longitudinal portions are relatively moved in said one direction in response to manually squeezing said hand grip.

4,462,792

REHEATING METAL BODIES WITH RECOVERED BLAST-FURNACE ENERGY

Jean-Luc Roth, and Herve Sierpinski, both of Metz, France, assignors to Institut de Recherches de la Sigerurgie Francaise, Saint Germain-en-Laye, France

Continuation-in-part of Ser. No. 415,828, Sep. 7, 1982. This application Sep. 13, 1982, Ser. No. 417,831
Claims priority, application France, Sep. 7, 1981, 81 17053
Int. Cl.³ F27D *3/00*; F23D *13/20*; C21B *9/00*
U.S. Cl. 432—11 **8 Claims**



1. A method of reheating metal bodies such as billets and

blooms before rolling same in a metal-refining operation having a blast furnace, the method comprising the steps of:

heating the top gas of the blast furnace to at least 800° C. by means of a plasma torch;

burning the heated top gas in a reheating chamber; and

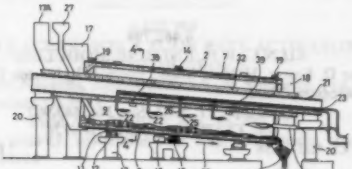
exposing the metal bodies in the reheating chamber to the heat of the burning and heated top gas.

4,462,793

ROTARY KILN AND METHOD OF USING SUCH A KILN

Takuya Maeda; Tsutomu Yamada, both of Kobe; Mitsuharu Kishimoto, Miki, and Atsuyoshi Kubotani, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 2, 1982, Ser. No. 404,128
Claims priority, application Japan, Aug. 3, 1981, 56-122129
Int. Cl.³ C21B *13/00, 11/06;* F27B *15/00, 7/36*
U.S. Cl. 432—14 11 Claims



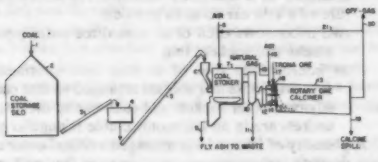
1. A rotary kiln for direct reduction using a solid reducing agent, said kiln comprising at least one substantially cylindrical shell rotatably mounted at an angle to the horizontal plane, at least one inner tube extending longitudinally into said shell and fixedly supported relative to said shell at both ends of said tube externally of said shell, said tube being covered over substantially its outer periphery by a refractory layer, said shell and tube forming a space therebetween, at least one flow passage for oxygen-containing gas provided within said tube, at least one nozzle tube supported by said inner tube, said nozzle tube extending radially through the wall of said inner tube and said refractory layer and connected with said passage, a burner nozzle located in said space, said nozzle being connected with said nozzle tube, and a temperature detector provided on the outside of said inner tube in said space.

4,462,794

METHOD OF OPERATING A ROTARY CALCINER RETROFITTED TO COAL-FIRING

Henry A. Pfeffer, III, Mercerville, and Judith N. Fradkin, Princeton, both of N.J., assignors to Intermountain Research & Development, Green River, Wyo.

Filed Nov. 12, 1982, Ser. No. 441,016
Int. Cl.³ F27B *15/00, 7/36*
U.S. Cl. 432—14 3 Claims



1. A method for operating a rotary calciner designed to process trona ore with oil or natural gas-firing and retrofitted to include coal-firing, which comprises

(a) burning coal with air in a coal furnace to yield combustion gases whose temperature is below the softening point of the coal ash;

(b) directing the coal-combustion gases, from which entrained fly ash particles have been removed, into proximity to a natural gas or oil booster burner;

(c) burning sufficient natural gas or oil in the booster burner, in the presence of the coal combustion gases but not in direct contact with the trona ore, to raise the temperature of the resultant combined combustion gases to at least 2300° F. but not more than 3000° F.;

(d) limiting the relative amount of natural gas or oil burned with respect to the coal such that at least half of the heat value in the resultant combined combustion gases is supplied from the coal combustion; and

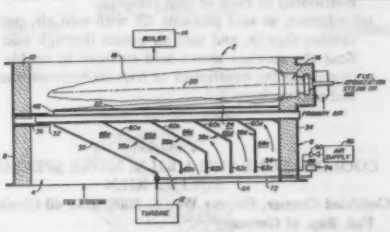
(e) introducing the resultant combined combustion gases into a rotary calciner, whereby up to a design capacity rate of material is processed by contact with such hot combustion gases.

4,462,795

METHOD OF OPERATING A WALL FIRED DUCT HEATER

Ralph R. Vosper, San Jose, Calif.; Arie W. Spoormaker, Maassluis, Netherlands; Chester S. Binasik, Palo Alto, Calif., and Norman E. Harthun, San Carlos, Calif., assignors to Coen Company, Inc., Burlingame, Calif.

Division of Ser. No. 182,249, Aug. 28, 1980, Pat. No. 4,375,952, which is a continuation-in-part of Ser. No. 073,348, Sep. 7, 1979, Pat. No. 4,286,945. This application Jan. 24, 1983, Ser. No. 460,202
Int. Cl.³ F24H *7/00, 1/00;* F23D *13/24, 15/00*
U.S. Cl. 432—29 3 Claims



1. A method for heating an exhaust gas flow through a duct defined by opposing duct walls comprising the steps of: generating an elongated flame with a fuel and an off-stoichiometric amount of primary combustion air; extending the flame from one duct wall towards the other duct wall; flowing exhaust gas in the form of exhaust gas streams about the flame along paths boundaries of which substantially intersect peripheries of the flame; flowing secondary combustion air transversely to and directly into an upstream portion of the flame, relative to the gas flow through the duct, over substantially the full length of the flame; equalizing the fuel-to-combustion air ratio in an upstream portion and in the downstream portion of the flame relative to the gas flow through the duct to thereby substantially uniformly and completely combust all fuel.

4,462,796

INTEGRATED CIRCUIT COMPONENT HANDLER MOVEMENT AND HEATING SYSTEM

Arlon J. Amundson, St. Paul; Robert A. Wurscher, Shoreview, and Jonathan P. Buesing, St. Paul, all of Minn., assignors to Micro Component Technology, Inc., Shoreview, Minn.

Filed May 19, 1982, Ser. No. 379,893
Int. Cl.³ F27B *15/00, 3/22*
U.S. Cl. 432—58 12 Claims

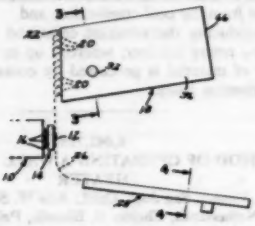
1. In combination with a test site electronically interfacing with an integrated circuit chip tester and means for consecutively introducing single chip carriers into the test site; appara-

tus for bringing chip carriers at least to a temperature at which they are maintained during operation of devices in which they are subsequently installed and for feeding the carriers to the consecutive introducing means, comprising:

(a) a plurality of generally vertically spaced, sloped tracks, each having an air permeable wall down a generally upwardly facing planar surface of which chip carriers move in being fed to the consecutively introducing means;

(b) a plurality of members, each defining a plenum beneath one of said walls;

(c) means for generating air heated to at least a temperature at which the chip carriers are maintained during operation



of the devices in which they are subsequently installed; and

(d) means for introducing air so heated into said plenums, said introducing means including a manifold chamber communicating with each of said plenums, into which chamber heated air is channeled and from which said air is distributed to each of said plenums;

(e) wherein, as said plenums fill with said air, pressure increases therein, and said air passes through said walls to float the carriers above said surfaces to enable them to overcome the coefficient of friction between the carriers and said surfaces.

4,462,797

COOLING ZONE FOR A KILN, MORE SPECIALLY A ROLLER KILN

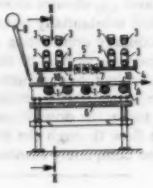
Gottfried Cremer, Steyrer Weg 6, 5000 Köln 40 (Junkersdorf), Fed. Rep. of Germany

PCT No. PCT/DE81/00133, 371 Date Apr. 21, 1982, 102(e) Date Apr. 21, 1982, PCT Pub. No. WO82/00876, PCT Pub. Date Mar. 18, 1982

PCT Filed Aug. 28, 1981, Ser. No. 375,025

Int. Cl.³ F28F *27/00*; F27D *15/02*; F27B *9/00, 5/04*

U.S. Cl. 432—77 **1 Claim**



1. A kiln for firing ceramic tiles, said kiln having a housing, said housing having preheating, firing, and cooling zones arranged in tandem therein, a transport means consisting of a plurality of driven rollers forming a transport surface extending through said zones for transporting the tiles therethrough in a single layer, said kiln characterized in that said cooling zone forms a chamber having a non-oxidizing atmosphere which is substantially self-contained and static except for currents resulting from thermal convection, a plurality of conduits containing a moving thermal energy absorbing liquid mounted in said cooling zone of said kiln above said transport means, said conduits extending normal to the direction of movement of tiles on said transport means, said conduits being arranged in groups spaced apart lengthwise of the kiln, a stationary debris catching plate beneath each group, said plates being spaced to provide a flow path therebetween for the upward passage of gases heated by the tiles, an adjustable damper element mounted between adjacent plates and in the flow path for controlling the flow rate of heated gas through said flow path for regulating the rate of cooling of the tiles, and further characterized in that a refractory panel is provided in said cooling zone only beneath said transport means; and further characterized in that gas introduction means is provided for introducing gas having a desired property into said chamber to regulate the atmosphere to produce a desired effect on the surface of the kilned goods transported through said cooling zone, said gas introduction means including gas inlet means positioned below said debris catching plates and above said rollers for directing the gas directly into the kilned goods transported through the cooling zone.

4,462,798

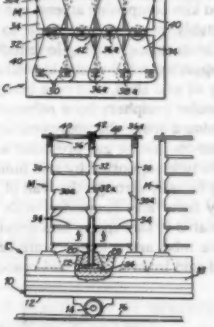
KILN CAR FURNITURE MODULE(S)

Bryan D. Foster, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Filed Apr. 11, 1983, Ser. No. 483,987

Int. Cl.³ F27D *1/12*; F27B *9/26*

U.S. Cl. 432—258 **10 Claims**



1. A refractory kiln car furniture module for supporting refractory and ceramic ware in spaced and stacked relationship within a plurality of adjacent bays during firing thereof in a kiln comprising:

At least three spaced rows of relatively large refractory post support blocks having post sockets of predetermined depth and configuration supported by and triangularly arranged on a thermally insulated refractory base structure of a kiln car so as to provide

two outer rows each of at least three outer post support blocks and sockets and,

an intermediate row of at least two intermediate post support blocks and sockets arranged so that each pair of adjacent outer sockets and each one of the intermediate sockets are in an interconnectable triangular pattern;

A plurality of triangularly arranged vertical outer and intermediate refractory posts supported by and extending upwardly from the respective outer and intermediate blocks and triangularly arranged sockets having

upper end portions and

lower end portions fitted into the triangularly arranged sockets of the blocks;

refractory batt support means on and vertically spaced along

sides of the posts for supporting engagement with at least three triangularly spaced edge portions of each batt in each stack of batts in adjacent bays of the module;

a plurality of refractory batts resting horizontally on and supported by the support means at at least three triangularly spaced edge portions of each batt in each bay of the module:

refractory coupling means including tie pins extending upwardly from the upper end of each outer and intermediate post;

A plurality of overlapping horizontal refractory tie plates, each having triangularly arranged holes into which three of the tie pins extend, interconnect, and tie the upper end portions of the outer and intermediate posts together; and

a tie bar with at least two holes therein adapted to receive at least two tie pins, extending between, interconnecting, and tying the intermediate posts and inner overlapping portions of the tie plates together.

4,462,799

DOUBLE SCREW FOR A FOUR PART ACTIVATOR IN JAW ORTHOPEDICS

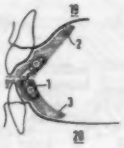
Alessandro Nardella, Eggensteiner Str. 20, Stutensee, Fed. Rep. of Germany (D-7513)

Filed Apr. 21, 1983, Ser. No. 487,137

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214844

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—7 **5 Claims**



1. An orthopedic appliance adapted to be disposed in the mouth of a person for simultaneously acting upon the upper and lower jaw, said appliance comprising:

a first web part having a screw-receiving end and a junction end longitudinally spaced from said screw-receiving end, said first web part having a first transverse hole therethrough at said screw-receiving end thereof;

first expansion screw means for displacing the dentition of the upper jaw, said first expansion screw means extending through said first hole transversely of said first web part;

first screw-turning means for rotating said first expansion screw means;

a first pair of left and right retention members disposed transversely of said screw-receiving end of said first web part on opposite sides thereof, each of said first pair of left and right retention members having a threaded hole surrounding and threadably engaged with said first expansion screw means, so that the transverse spacing between each of said retention members and said first web part can be varied by rotation of said first expansion screw means;

a second web part having a screw-receiving end and a junction end longitudinally spaced from said screw-receiving end,

said second web part having a second transverse hole therethrough at said screw-receiving end thereof, said second transverse hole being substantially parallel to said first transverse hole;

second expansion screw means for displacing the dentition of the lower jaw, said second expansion screw means extending through said second hole transversely of said second web part

second screw-turning means for rotating said second expansion screw means;

a second pair of left and right retention members disposed transversely of said screw-receiving end of said second web part on opposite sides thereof, each of said second pair of left and right retention members having a threaded hole surrounding and threadably engaged with said second expansion screw means, so that the transverse spacing between each of said retention members and said second web part can be varied by rotation of said second expansion screw means;

hinge means pivotably interconnecting the junction ends of said first and second web parts for relative rotation about a transverse axis substantially parallel to said transverse holes in said web parts; and

releasable hinge locking means operatively associated with said hinge means for preventing relative rotation of said web parts about said axis, thereby maintaining said web parts in a selected relative angular orientation.

4,462,800

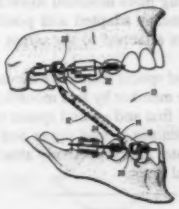
ORTHODONTIC BITE JUMPING DEVICE

Marston Jones, Rainbow Farm, Rte. 1, Box 115C, Salisbury, Md. 21801

Filed Nov. 4, 1982, Ser. No. 439,213

Int. Cl.³ A61C *3/00*

U.S. Cl. 433—19 **15 Claims**

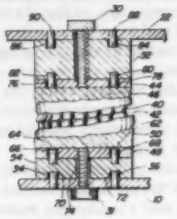


1. An orthodontic bite jumping device for attachment to orthodontic brace wires affixed to the teeth of the upper and lower jaw of a patient for treatment of overbite, comprising: a telescope mechanism having a telescope outer tube portion and a telescope inner plunger position, each of said tube portion and plunger portion having a ring member with central opening attached at the outer end thereof; a pair of trunnion members, one of said trunnion members being received in the opening of each of said ring members, each trunnion member having a structurally integral flange on the outer end thereof retaining the respective ring member on the trunnion; a radial slot located in each trunnion member adjacent the inner end thereof for receiving one of said brace wires, said slot being defined by a pair of side walls and a bottom wall, said side walls being located in parallel planes which are perpendicular to the longitudinal axis of the respective trunnion, said side walls extending to the exterior of said trunnion so that said slot is open along its entire length to receive one of said brace wires; each of said trunnions having an axial bore in the outer end thereof, said bore being in communication with the espective radial slot and being substantially perpendicular thereto; and means mounted in each of said bores for securing said respective trunnion to one of said brace wires with said brace wire in position within the respective slot.

4,462,801
DENTAL ARTICULATORS

Peter Lagios, 7S665 Carriage Way, Naperville, Ill. 60540

Filed Jun. 14, 1982, Ser. No. 388,020
Int. Cl.³ A61C 11/00
U.S. Cl. 433—60 7 Claims



3. In a dental articulator of the type having upper and lower frame members each with means to support dental casts in opposed relationship, the frame members joined in a manner to permit manipulation of the dental casts to duplicate the movements of the human mandible so that precise dental relationships and measurements may be made, an improvement comprising:

a first spacer means for being mounted on said means to support dental casts on said upper frame member, said first spacer means including means to mount and dismount a maxillary dental cast in the opposed relationship;

a second spacer means for being mounted on said means to support dental casts on the lower frame member, said second spacer means including means to mount and dismount a mandibular dental cast in opposed relationship;

a threaded mounting plate mounted to each of said first and second spacer means adapted and positioned to receive mounting screws attached to the upper and lower frame members;

said first and second spacer means are mounted to said upper and lower frame member by said mounting screws extending through said first and second spacer means and engaging threaded openings in said upper and lower mounting plates which plates are respectively attached to the upper and lower dental casts.

4,462,802
DENTAL ROOT MARKING AND MEASURING INSTRUMENT FOR ENDODONTIC SURGERY

Akio Sekiya, 12-32, Sakae 3-chome, Naka-ku, Nagoya-shi, Aichi-ken, Japan

Filed Jan. 13, 1983, Ser. No. 457,685
Int. Cl.³ A61C 19/04
U.S. Cl. 433—72 3 Claims

1. A dental root marking and measuring instrument for use in endodontic surgery, comprising:

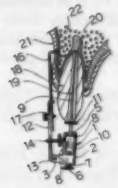
(a) a main body;

(b) a reamer;

(c) a reamer mounting portion provided in said main body, said reamer having a grip portion mounted on said reamer mounting portion so that it may have an end reaching the apex of a dental root;

(d) an arm disposed alongside of said reamer, and having a base end rotatably supported on said main body and a free end which is rotatable toward said reamer;

(e) a positioning member provided in the lower portion of said arm for adjusting the distance between said main body and said arm; and

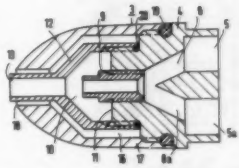


(f) an indicating pin connected to the upper portion of said arm, and having a free end which is alignable with said end of said reamer, said pin being adapted to put a mark on the gum.

4,462,803
DEVICE FOR CLEANING TEETH

Hermann Landgraf, Heppenheim, and Josef Hain, Laudenbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 13, 1982, Ser. No. 408,124
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132291
Int. Cl.³ A61C 3/02
U.S. Cl. 433—88 7 Claims



1. In a device for processing a surface of an object, such as for cleaning teeth, by directing water and a carrier gas containing an abrasive at said surface, said device including a nozzle having at least one water discharge aperture and a gas discharge aperture adjacent the water discharge aperture, said water discharge aperture being connected to a channel extending to means for connection to a source of water and said carrier gas discharge aperture being in communication with a carrier gas channel connectible to a source of gas containing the abrasive, the improvements comprising said carrier gas channel adjacent said gas discharge aperture terminating in a mixing chamber in communication with said gas discharge aperture, and an additional channel connectible to a source of abrasive-free gas discharging through an acceleration jet into said mixing chamber for discharge through said gas discharge aperture, said acceleration jet creating a flow of the abrasive-free gas in the mixing chamber toward the gas discharge aperture and creating a suction for entraining the carrier gas with the abrasive into the flow of the abrasive-free gas, said chamber having a configuration of a converging annular chamber with an axis disposed on the axis of the acceleration jet so that the abrasive-free gas being conveyed in said additional channel can be from a source having a higher acceleration energy in comparison to the carrier gas sio that the gas containing the abrasive is accelerated as it passes from said mixing chamber through said gas discharge aperture.

4,462,804

HIGH BULK DENSITY PARTICULATE HEAVY DUTY LAUNDRY DETERGENT

William J. Gangwisch, New Brunswick; Virgil J. Richter, West Orange; Harold E. Wixon, New Brunswick, and Joseph B. Wraga, Bogota, all of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 210,863, Nov. 26, 1980, Pat. No. 4,399,048, which is a continuation of Ser. No. 839,780, Oct. 6, 1977, Pat. No. 4,264,464. This application Sep. 29, 1982, Ser. No. 427,945

Int. Cl.³ C11D *3/08, 3/10, 3/12, 11/02*

U.S. Cl. 8—137 10 Claims

1. A method of laundering fabrics without producing substantial deposits of insoluble material thereon, which comprises:

combining an aqueous solution an effective cleaning amount of a free-flowing, phosphate-free, particulate, heavy duty laundry detergent with a fabric to be laundered, agitating the resulting mixture to remove foreign matter from said fabric and removing said solution from said fabric;

said free-flowing, phosphate free, particulate, heavy duty, laundry detergent having a bulk density greater than 0.6g/ml and comprising non-ionic detergent-containing beads which are produced by

(a) preparing a crutcher mix by adding sufficient water soluble sodium silicate to an aqueous slurry of sodium carbonate, sodium bicarbonate and a detergent building ion exchanging aluminosilicate zeolite to form a gel, said zeolite having an average ultimate particle diameter of about 15 microns or less;

(b) shearing the gel to reduce the viscosity thereof,

(c) adding additional sodium silicate to the sheared gel, such that the crutcher mix contains from about 2 to about 15% by weight of the silicate,

(d) spray drying the crutcher mix to form beads having a water content of about 2 to about 12% and the proportions of zeolite, sodium carbonate and sodium bicarbonate in the spray dried beads are in the range of 1:0.3–1.6:0.2–2.0, on an anhydrous basis,

(e) mixing with said beads from 0.2 to 1.6 parts of nonionic detergent in liquid form so that such detergent is absorbed into the beads.

4,462,805

MIXTURE OF CATIONIC COMPOUNDS FOR DYEING AND PRINTING TEXTILES, LEATHER AND PAPER

Willy Stingelin, Reinach, and Peter Loew, Münchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

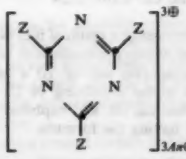
Filed May 10, 1983, Ser. No. 493,183

Claims priority, application Switzerland, May 18, 1982, 3050/82

Int. Cl.³ D06P *3/32*

U.S. Cl. 8—436 18 Claims

1. A mixture of at least two cationic compounds of the formula



III

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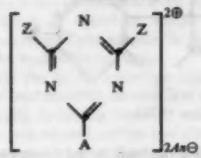
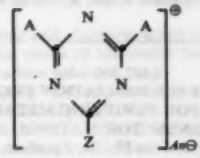


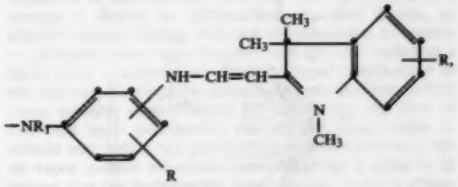
IIIa



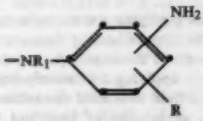
IIIb

wherein

Z is a radical of the formula



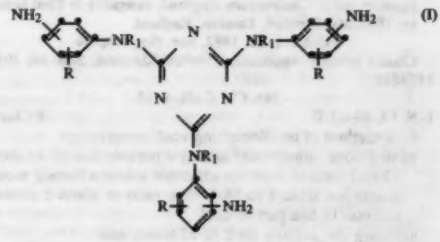
A is a radical of the formula,



wherein R is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, and R_1 is hydrogen or C_1–C_4-alkyl, and

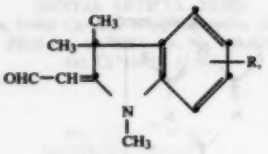
An is an anion,

which mixture is obtained by reaction of a compound of the formula I



(I)

with an aldehyde compound of the formula II



(II)

in an aqueous or organic medium, in the presence of an acid, in which formulae, the symbols R and R_1 are as defined in the foregoing.

4,462,806

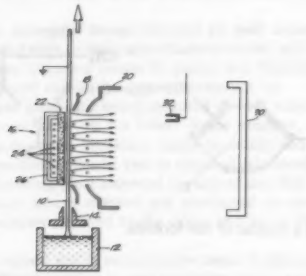
HIGH FIELD SURFACE IONIZATION PROCESS AND APPARATUS FOR PURIFYING METAL AND SEMICONDUCTOR MATERIALS

John F. Mahoney, 1115 Avon Pl., So. Pasadena, Calif. 91030, and Julius Perel, 1811 N. Grand Oaks, Altadena, Calif. 91001

Continuation-in-part of Ser. No. 138,225, Apr. 7, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,174

Int. Cl.³ C01B *33/02*

U.S. Cl. 23—293 R **12 Claims**



1. A process for purifying a semiconductor or metal material, comprising the steps of heating the material to increase the diffusion coefficients of the impurity elements to be removed and simultaneously applying a relatively high intensity, non-alternating electric field to at least one surface of the material, the simultaneous application of heat and the electric field causing atoms of the impurity elements to diffuse to said one surface of the material where such atoms will be ionized by surface ionization and the ions so formed will be pulled from said surface by said electric field.

4,462,807

METHOD OF DECHLORINATING COAL

Sarath S. Jayasinghe; Michael A. Hooker, and Denis H. T. Spencer, all of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jul. 21, 1982, Ser. No. 400,354

Claims priority, application United Kingdom, Sep. 19, 1981, 8128318

Int. Cl.³ C10L *9/02*

U.S. Cl. 44—1 R **8 Claims**

8. A method of dechlorinating coal comprising:

mixing comminuted coal having a particle size up to about 12 mm with an aqueous ammonia solution having a concentration from 1 to 18 M in a ratio of about 5 parts of solution to one part of coal;

agitating the mixture for 3 to 25 hours; and

centrifuging the mixture to separate the solids from the liquid.

4,462,808

DISPERSANT FOR HIGH SOLIDS COAL-WATER SLURRIES

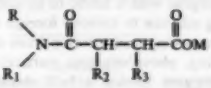
Anthony E. Gross, Clarendon Hills; Merle L. Branning, Warrenville, and Dodd W. Fong, Naperville, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 4, 1983, Ser. No. 520,351

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **6 Claims**

1. An improved coal-water slurry of the type comprising at least 45% by weight of finely divided coal particles and a dispersing agent, said slurry being characterized as having a Brookfield viscosity at 60 rpm of less than 3000 centipoise, the improvement comprising adjusting the ph of said slurry to at least 6 and using as the dispersing agent a water-soluble homopolymer of a monomer represented by the formula:



wherein:

M is hydrogen, lithium, sodium, potassium, magnesium, or calcium;

R is allyl or methallyl;

R_1 is hydrogen, allyl or methallyl;

R_2 is hydrogen or sulfonate;

R_3 is hydrogen or sulfonate; and providing that R_2 is not the same as R_3.

4,462,809

METAL-CONTAINING PRODUCTS OF PHOSPHOSULFURIZED AMIDES AND LUBRICANTS CONTAINING SAME

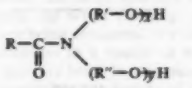
Joan M. Kaminski, Clementon, and Andrew G. Horodysky, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,328

Int. Cl.³ C10L *1/26*; C10M *1/48*

U.S. Cl. 44—67 **24 Claims**

1. A reaction product made by (1) reacting a phosphorus polysulfide with a compound of the formula



wherein R is a hydrocarbyl group containing 8 to 30 carbon atoms, R′ and R″ are C_2–C_6 aliphatic groups and x and y are 1 to 7, and (2) reacting this product with a metal-containing compound.

4,462,810

ZIRCONIUM-CERIUM ADDITIVES FOR RESIDUAL FUEL OIL

Peter J. Jessup, Millington, and Nicholas Feldman, Woodbridge, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 17, 1983, Ser. No. 523,966

Int. Cl.³ C10L *1/24*

U.S. Cl. 44—68 **12 Claims**

1. A composition comprising a residual fuel oil and an effective trace amount of an additive combination comprising:

(a) an oil soluble zirconium salt of: (i) a carboxylic acid selected from the group consisting of C_4–C_{22} linear or branched fatty acids, tall oil, and naphthenic acid; (ii) an alcohol or phenol having the formula:

ROH

where R is a hydrocarbyl group of 2–24 carbon atoms; or (iii) a sulfonic acid having the formula:

RSO_3H

where R is an alkyl, cycloalkyl, aryl, alkaryl or aralkyl group and said salt has a molecular weight of about 100 to about 2500; and

(b) an oil soluble cerium salt of: (i) a carboxylic acid selected from the group consisting of C_4–C_{22} linear or branched fatty acids, tail oil, and naphthenic acid; (ii) an alcohol or phenol having the formula:

ROH

where R is a hydrocarbyl group of 2–24 carbon atoms; or (iii) a sulfonic acid having the formula:

RSO_3H

where R is an alkyl, cycloalkyl, aryl, alkaryl or aralkyl group and said salt has a molecular weight of about 100 to about 2500; and

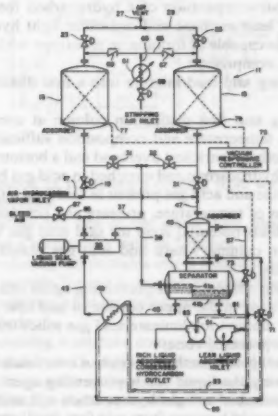
said zirconium and cerium salts being present in a weight ratio of about 1:5 to about 10:1 parts of zirconium to parts of cerium, and said amount of additive combination being effective in reducing the amount of particulate matter formed during combustion.

4,462,811

PROCESS AND APPARATUS FOR REMOVING HYDROCARBONS FROM AIR-HYDROCARBON VAPOR MIXTURES

Harold L. Dinsmore, Tulsa, and Jon W. Young, Jr., Broken Arrow, both of Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Jul. 26, 1983, Ser. No. 517,600
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—18 **20 Claims**



1. In a process for recovering hydrocarbons from an air-hydrocarbon vapor mixture, the steps comprising:

(a) passing an air-hydrocarbon vapor mixture through a first carbon bed which adsorbs the hydrocarbons, permitting substantially hydrocarbon free air to be vented to the atmosphere;

(b) subjecting a second carbon bed to a vacuum condition by means of a vacuum pump, to regenerate said second carbon bed by desorbing hydrocarbons which have previously been adsorbed thereby;

(c) circulating the air-hydrocarbon vapor mixture exhausted from said second carbon bed to an absorber having means for providing an absorbent liquid through which said air-hydrocarbon vapor mixture is passed to absorb a portion of the hydrocarbon vapor;

(d) returning the air-hydrocarbon vapor mixture from the output of said absorber to said first carbon bed;

(e) periodically switching said first and second carbon beds whereby said second carbon bed receives said air-hydrocarbon vapor mixture and said first carbon bed is regenerated by desorbing hydrocarbons previously adsorbed therein;

(f) circulating said absorbent liquid through said absorber during the cycles of alternately desorbing said first and second carbon beds; and

(g) interrupting said circulation of absorbent periodically during the initial period of the desorption of each carbon bed until the level of hydrocarbon content in the air-hydrocarbon vapor exhausted from said each carbon bed is sufficiently high to be at least partially absorbed in said absorber.

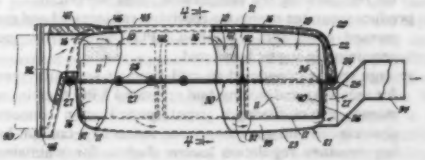
15. Apparatus for recovery of hydrocarbons from an air-hydrocarbon vapor mixture comprising means for regenerating a carbon bed used in the adsorption of hydrocarbons including an adsorber including a carbon bed, a vacuum pump connected to said adsorber to subject said carbon bed to a vacuum to desorb the hydrocarbons deposited therein, an absorber communicating with said vacuum pump, to receive an air-hydrocarbon vapor mixture, said absorber including a liquid pump to circulate an absorbent liquid therethrough so that said absorbent liquid is contacted by said air-hydrocarbon vapor mixture, control means for interrupting the flow of absorbent liquid periodically, said vacuum pump begins to exhaust said carbon bed until the hydrocarbon content of the air vapor mixture exhausted from said pump is equal to or greater than the hydrocarbon vapor content in the overhead gas of said absorber when liquid absorbent is flowing to said absorber.

4,462,812

CERAMIC MONOLITH PARTICULATE TRAP INCLUDING FILTER SUPPORT

Kenneth B. Bly, Pontiac; Terrance L. Stark, Washington, and Otto A. Ludecke, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 8, 1982, Ser. No. 447,776
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—502 **3 Claims**



1. A particulate trap for use in the exhaust system of a diesel engine to effect removal of particulates from the exhaust gases discharged from the engine, said particulate trap including a trap housing means having wall means defining a chamber with an exhaust inlet means at one end and an exhaust outlet at its opposite end; at least one ceramic monolith wall flow particulate filter having an inlet end and an outlet end in said chamber of said trap housing means; and, a support means, including a cylindrical support and a mat of refractory materials, operatively positioned around a portion of said at least one particulate filter next adjacent to said outlet end and positioned and arranged with respect to said wall means so as to effect support

of said at least one particulate filter within said trap housing means in a manner to prevent bypass flow from said exhaust inlet means around said at least one particulate filter to said exhaust outlet, at least 50% of the exterior surface of said at least one particulate filter next adjacent to its inlet end being in spaced apart relationship to said wall means so as to define a passage means in flow communication with said exhaust inlet means whereby incoming exhaust gases can flow around the exposed portion of said at least one particulate filter to heat the exterior thereof next adjacent to said inlet end so as to effect a reduction of the thermal stress on said at least one particulate filter during engine operation.

4,462,813

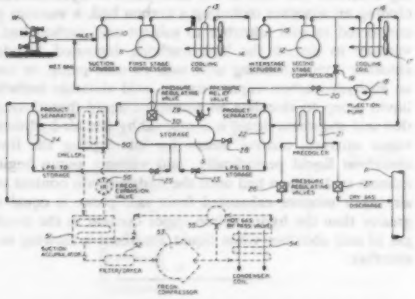
SYSTEM AND METHOD FOR CONVERTING WELLHEAD GAS TO LIQUEFIED PETROLEUM GASES (LPG)

Ronald L. May, Kingwood, and Bobby W. Sinclair, Wichita Falls, both of Tex., assignors to Sappsucker, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 369,159, Apr. 19, 1982, Pat. No. 4,419,114. This application Dec. 5, 1983, Ser. No. 557,852

Int. Cl.³ F25J *3/00, 5/00*

U.S. Cl. 62—17 **22 Claims**



1. A system for converting natural wellhead gas to liquefied petroleum gases (LPG) containing propane and petroleum gases of lesser vapor pressures comprising components sized and designed to process wells producing less than 1000 MCFD, including:

gas compressor means connected to said wellhead for compressing natural gases received therefrom;

refrigeration means in heat exchange with said compressed natural gases downstream of said gas compressor means for refrigerating the compressed gases therefrom;

product separator means for receiving refrigerated and compressed gases and separating LPG therein from gases remaining in vapor form; and

storage means connected to said product separator means for receiving and storing said separated LPG therein, said storage means having a vapor space therein connected upstream of said gas compressor means by a conduit having pressure regulation means therein for maintaining pressure in said vapor space but allowing flow of LPG vapors from said vapor space when the vapor pressure therein exceeds a predetermined value, thereby recirculating some of said LPG vapors with said natural gases from said wellhead through said compressor means, said refrigeration means and said product separator means.

12. A method of converting natural wellhead gas to liquefied petroleum gases (LPG) containing propane and petroleum gases of lesser vapor pressures comprising the steps of:

separating natural gas from petroleum fluids exiting a wellhead producing less than 1000 MCFD;

compressing said natural gas;

cooling said compressed natural gas;

refrigerating said compressed natural gas to liquefy at least a portion thereof;

separating LPG from gas vapors of said refrigerated compressed natural gas;

storing said separated LPG in a storage tank having a vapor space therein;

recirculating a portion of the LPG vapors in said vapor space with said natural gas exiting said wellhead to enhance the recovery of LPG.

4,462,814

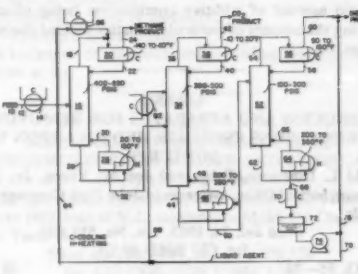
DISTILLATIVE SEPARATIONS OF GAS MIXTURES CONTAINING METHANE, CARBON DIOXIDE AND OTHER COMPONENTS

Arthur S. Holmes, Shrewsbury, and James M. Ryan, Weston, both of Mass., assignors to Koch Process Systems, Inc., Westboro, Mass.

Continuation of Ser. No. 308,164, Oct. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 94,226, Nov. 14, 1979, Pat. No. 4,318,723, and Ser. No. 131,416, Mar. 18, 1980, abandoned, and Ser. No. 143,099, Apr. 23, 1980, Pat. No. 4,293,322, and Ser. No. 306,419, Sep. 28, 1981, Pat. No. 4,350,511. This application Mar. 18, 1983, Ser. No. 476,520

Int. Cl.³ F25J *3/04*

U.S. Cl. 62—17 **32 Claims**



1. A distillative separation of a hydrocarbon feed mixture containing at least methane and one other light hydrocarbon and an acid gas capable of forming an azeotrope with said light hydrocarbon, comprising:

a. introducing said feed mixture into a first distillation column;

b. operating said first distillation column at conditions of pressure, temperature and composition sufficient to produce a methane-enriched overhead and a bottoms containing light hydrocarbon and enriched in acid gas based upon the methane and acid gas present in said feed mixture, said conditions of temperature, pressure and composition creating a solids potential zone for said acid gas within the distillation column where said acid gas would normally form solids;

c. introducing a liquid solids-preventing agent into the solids potential zone in the upper portion of said first column in sufficient amount to eliminate acid gas solids formation in the solids potential zone;

d. withdrawing said methane-enriched overhead;

e. withdrawing the liquid solids-preventing agent with said bottoms enriched in light hydrocarbon and said acid gas;

f. introducing said bottoms from said first distillation column into a second distillation column;

g. operating said second distillation column at conditions of pressure, temperature and composition sufficient to produce an acid gas-enriched overhead stream and a light hydrocarbon-enriched bottoms based upon the light hydrocarbon and acid gas present in bottoms from the first distillation column introduced into said second distillation column, said conditions of pressure, temperature and composition also being sufficient normally for the forma-

tion of an acid gas/light hydrocarbon azeotrope which would limit the concentration of acid gas in said overhead stream to the azeotropic concentration, based upon a binary mixture of said acid gas and said light hydrocarbon;

h. introducing into the upper portion of said distillation column and above the point of introduction of bottoms from said first distillation column a liquid agent sufficient to provide a relative volatility of greater than 1 of said acid gas to said light hydrocarbon at or below the point of introduction of the liquid agent to provide an acid gas-enriched overhead stream having an acid gas concentration greater than the azeotropic concentration of a binary mixture of said acid gas and said light hydrocarbon;

i. withdrawing said acid gas-enriched overhead from the second distillation column; and,

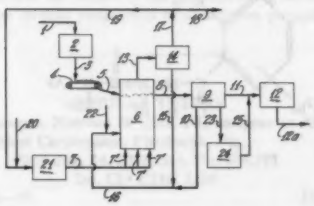
j. withdrawing said light hydrocarbon-enriched bottoms from the second distillation column.

4,462,815

SCRAP GLASS RECOVERY

Mark A. Propster, Gahanna, and William L. Streicher, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 20, 1982, Ser. No. 451,115
Int. Cl.³ C03B 5/16
U.S. Cl. 65—2 **10 Claims**



1. A method of removing a coating from scrap glass fibers which comprises:

(a) reducing the size of the scrap glass fibers to particles having a length of ¼ inch to 2 inches;

(b) introducing the particles into a fluidized bed comprising sand suitable for use in producing glass fibers;

(c) introducing a hot oxidizing gas upwardly into said fluidized bed;

(d) recovering a mixture comprising paticulate glass fibers and sand from the upper portion of said bed;

(e) introducing the mixture into separation means to produce substantially clean particulate fibers and a recycle sand stream;

(f) introducing said substantially clean particulate fibers into a glass melting furnace;

(g) combining said recycle sand stream with a fresh sand stream and introducing the combined stream into said bed;

(h) recovering a hot gas and sand stream from the upper portion of said fluidized bed; and,

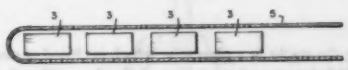
(i) combining said hot gas stream with a hot oxidizing gas and introducing the combined stream into said fluidized bed.

4,462,816

METHOD FOR MAKING SINTERED SILICON NITRIDE ARTICLES

Robert W. Wolfe, Wysox, and Joseph J. Cleveland, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 8, 1983, Ser. No. 502,413
Int. Cl.³ C03D 25/02; C04D 35/56
U.S. Cl. 65—23 **9 Claims**



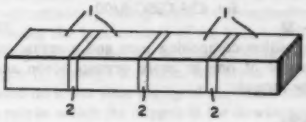
1. In the process of making a sintered silicon nitride article by pressing a preform from silicon nitride powder and then isostatically pressing the preform at high temperature and high pressure to make the sintered silicon nitride article, the improvement which comprises the steps of assembling a plurality of such preforms in a stack with spacers separating the preforms from each other, the spacers comprising material that is inert with respect to the silicon nitride preforms and having a melting point above the isostatic pressing temperature, enclosing the stack in a sealed glass capsule, hot isostatically pressing the glass capsule, removing the glass from around the stack, and then separating the sintered silicon nitride articles from each other, the separating step being eased because of the spacers.

4,462,817

METHOD OF PREPARING SILICON NITRIDE ARTICLES FOR SINTERING

Robert W. Wolfe, Wysox, and Joseph J. Cleveland, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 8, 1983, Ser. No. 502,381
Int. Cl.³ C03C 25/02; C04B 35/56
U.S. Cl. 65—36 **4 Claims**



1. In the process of making a sintered silicon nitride article by pressing a preform from silicon nitride powder and then isostatically pressing the preform at high temperature and high pressure to make the sintered silicon nitride article, the improvement which comprises the steps of assembling a plurality of such preforms in a stack with spacers separating the preforms from each other, completely enveloping the stack in refractory metal foil, enclosing the foil enveloped stack in a sealed glass capsule, hot isostatically pressing the glass capsule, removing the glass from around the stack, and then separating the sintered silicon nitride articles from each other.

4,462,818

PROCESS FOR SINTERING SILICON NITRIDE ARTICLES

Robert W. Wolfe, Wysox, and Joseph J. Cleveland, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jun. 8, 1983, Ser. No. 502,390
Int. Cl.³ C03C 25/02; C04B 35/56
U.S. Cl. 65—36 **4 Claims**

1. In the process of making a sintered silicon nitride article by pressing a preform from silicon nitride powder and then

isostatically pressing the preform at high temperature and high pressure to make the sintered silicon nitride article, the improvement which comprises the steps of assembling a plurality of such preforms in a stack with spacers separating the preforms from each other, preparing a plurality of such stacks,

inserting the stacks in a glass tube which is closed at one end, the stacks being spaced apart from each other within the tube, subjecting the tube to vacuum while heating it to the softening point of the glass, thereby collapsing the glass around each stack, and separating the stacks from each other so that each stack is encapsulated in a sealed glass capsule.

4,462,819

UREASE INHIBITED UREA BASED FERTILIZER COMPOSITIONS CONTAINING ORGANO BORON ACID COMPOUNDS

Michael Van Der Puy, Cheektowaga; Ralph C. Gatrone, Kenmore; Martin A. Robinson, Amherst, and Larry L. Hendrickson, Camillus, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 7, 1983, Ser. No. 482,747

Int. Cl.³ C05C *9/00*

U.S. Cl. 71—28 **29 Claims**

1. A composition comprising urea and a urease inhibiting effective amount of one or more organo boron acid compounds of the formula:

$$R_1R_2BOH$$

wherein:

R_1 and R_2 are the same or different and are hydroxy or substituted aryl radicals wherein permissible substituents are one or more moieties selected from the group consisting of electron donating groups, provided, however, that when either R_1 or R_2 is hydroxy, the other is substituted aryl; or one or more compounds which are capable of forming such acid compounds in situ.

13. A method of inhibiting the activity of urease in a growth medium which comprises applying to said medium a urease inhibiting effective amount of one or more organo boron acid compounds of the formula:

$$R_1R_2BOH$$

wherein:

R_1 and R_2 are the same or different and are hydroxy or substituted aliphatic or aryl radicals wherein permissible substituents are one or more moieties selected from the group consisting of electron donating groups, provided, however, that when either R_1 or R_2 is hydroxy, the other is substituted aryl, or one or more compounds which are capable of forming such acid compounds in situ.

4,462,820

METHOD OF CONTROLLING HARMFUL ORGANISMS USING MONO- AND DIBROMODICYANOMETHANE AND COMPOSITIONS CONTAINING THESE COMPOUNDS FOR THE CONTROL OF SUCH ORGANISMS

Heinhardt Grade, and Joachim Lorenz, both of Bensheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 1, 1982, Ser. No. 438,221

Claims priority, application Switzerland, Nov. 6, 1981, 7111/81

Int. Cl.³ A01N *37/34*; C10L *1/22*; C10M *1/06*; D21D *3/00*

U.S. Cl. 71—67 **5 Claims**

1. A method of inhibiting the growth and reproduction of harmful microorganisms in aqueous systems, in oils or in fuels which comprises contacting said microorganisms with a microbiocidal amount of 1 to 100 parts per million parts of said system, oil or fuel, of monobromodicyanomethane or dibromodicyanomethane.

4,462,821

SUBSTITUTED THIOSEMICARBAZIDES, THEIR MANUFACTURE AND USE AS PLANT GROWTH REGULANTS

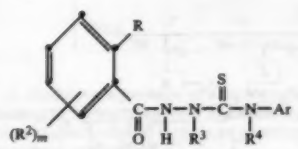
Jerry L. Rutter, Overland Park, and James L. Ahle, Shawnee, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 62,258, Aug. 2, 1979, Pat. No. 4,282,031, which is a continuation-in-part of Ser. No. 942,232, Sep. 14, 1978, abandoned, and Ser. No. 000,851, Jan. 3, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,938

Int. Cl.³ A01N *33/26*; C07C *101/26*

U.S. Cl. 71—99 **24 Claims**

1. A compound of the formula



wherein

R is

R^1 is —OH;

m is 0;

R^3 is methyl;

R^4 is hydrogen;

Ar is naphthyl or a group having the following formula:

each R^5 independently is C_1–C_4 alkyl chloro, bromo, fluoro, nitro, C_1–C_3 alkoxy of C_1–C_3 alkylthio, provided that both ortho positions are not substituted by alkyl;

R^6 is carbethoxy, phenoxy, benzyloxy, phenyl or dimethylamino;

n is 0, 1, or 2;

q is 0;
the sum of n plus q does not exceed 2;
or an agriculturally-acceptable salt or ester thereof.

4,462,822

MOLYBDENUM DIOXIDE-MOLYBDENITE ROASTING

Bruce J. Sabacky, Westminster, and Malcolm T. Hepworth, Golden, both of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Nov. 8, 1983, Ser. No. 549,845
Int. Cl.³ C22B 1/02
U.S. Cl. 75—7 9 Claims

1. The process for roasting molybdenite concentrates directly to molybdenum dioxide which comprises establishing a roasting zone having a temperature of about 700° C. to about 800° C., introducing into said roasting zone particulate molybdenum dioxide and molybdenite in a weight ratio of at least about 2:1 along with an oxygen-containing gas in amount sufficient to oxidize the sulfur content of said molybdenite and oxidizing said molybdenite to molybdenum dioxide within said roasting zone.

4,462,823

TREATMENT AGENTS FOR MOLTEN STEEL

Paul I. Fontaine, Solihull; Evan T. R. Jones, Sutton Coldfield, and John K. Batham, Brierley Hill, all of England, assignors to Foseco International Limited, Birmingham, England

Filed Nov. 23, 1983, Ser. No. 554,700
Claims priority, application United Kingdom, Dec. 11, 1982, 8235377
Int. Cl.³ C21C 7/02
U.S. Cl. 75—58 14 Claims

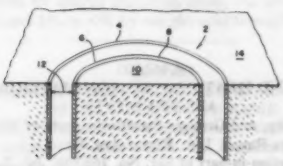
1. A particulate treatment agent for molten steel which comprises granules containing aluminium and at least one magnesium compound selected from the group consisting of magnesium oxide and magnesium carbonate, the proportion of the aluminium in the surface of the granules being substantially less than the overall proportion of aluminium present in the granules.

4,462,824

ANNULAR TUYERE

John D. Nauman, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Jun. 14, 1983, Ser. No. 504,191
Int. Cl.³ C21C 5/34
U.S. Cl. 75—60 11 Claims



1. An annular tuyere for flowing a gas into a molten metal bath comprising:

a tube being resistant to corrosive attack by molten metal and slag, wherein the gas flowing through the tube also cools the tip of the tuyere tube adjacent the molten metal; and

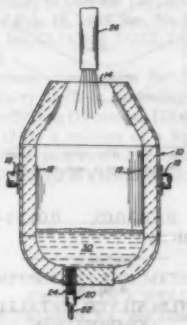
means for further cooling of the tuyere tip adjacent the molten metal bath to have the effect of raising the critical bath temperature at which the tuyere tip would begin melting at gas flow rates through the tuyere of about 250 scfm/in² of the tuyere area of less, said means includes a relatively thin tube wall thickness of less than 0.100 inch.

4,462,825

METHOD FOR INCREASING THE SCRAP MELTING CAPABILITY OF METAL REFINING PROCESSES

Charles J. Messina, Valparaiso, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sep. 1, 1983, Ser. No. 528,377
Int. Cl.³ C21C 5/34
U.S. Cl. 75—60 13 Claims



1. In the refining of a molten metal bath contained in a refining vessel of the type having a "mouth" at the top thereof, wherein a refining gas comprising oxygen (a) is injected below the surface of the bath, to combine with carbon in the molten metal, resulting in the evolution of carbon monoxide from the bath, and (b) is blown downwardly toward the bath from a nozzle above the bath surface to oxidize the carbon monoxide, forming high temperature gases above the bath surface, which high temperature gases serve to increase the heat content of the bath and its capability to melt solid additions made thereto, the formation of such high temperature gases having the undesirable side-effect of deteriorating the refractory lining of the vessel above the bath surface in vessels having a bath surface-to-volume ratio insufficient to prevent such deterioration,

the improvement for materially decreasing the deterioration of said refractory lining while concomitantly materially increasing the heat content of the bath which comprises, blowing the downwardly directed refining gas comprising oxygen (i) through a nozzle, the lower end of which is located no lower than the lip of the vessel mouth, and (ii) at a rate in which the oxygen in the downwardly directed refining gas is within a range equal to 17.64% to 42.86% of the rate at which said oxygen is injected below the surface of the bath.

4,462,826

LOW-LOSS AMORPHOUS ALLOY

Koichiro Inomata, Yokohama; Michio Hasegawa, Tokyo, and Tadahiko Kobayashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

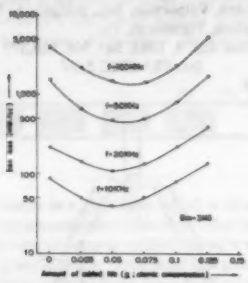
Filed Sep. 7, 1982, Ser. No. 415,489
Claims priority, application Japan, Sep. 11, 1981, 56-142250; Sep. 11, 1981, 56-142251; Feb. 26, 1982, 57-28936
Int. Cl.³ F16H 29/10
U.S. Cl. 75—123 B 9 Claims

1. A low-loss amorphous alloy for a toroidal core material consisting essentially of the following formula:

$$(Fe_{1-a-b}Nb_aM_b)_{100-c}X_c$$

wherein M is at least one metallic element selected from the group consisting of V, Cr, Mo, Ta and W; X is a combination

of B and Si, the amount of Si being more than 0 to 10 or less atomic percent; and a, b and c satisfy the relations of



$0.01 \leqq a \leqq 0.075$, $0 \leqq b \leqq 0.05$, $0.02 \leqq a+b \leqq 0.075$ and $12 \leqq c \leqq 21$, respectively.

4,462,827

THICK FILM SILVER METALLIZATION COMPOSITION

Joseph R. Rellick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1982, Ser. No. 442,954
Int. Cl.³ H01B 1/02
U.S. Cl. 106—1.19 **4 Claims**

1. Thick film silver composition suitable for metal surface metallization comprising:

65 to 95% by weight of silver particles, and

5 to 35% by weight of particles of an alloy of cadmium and antimony having an antimony content of 25–80% by weight, the weights based on the total inorganic solids present, the solids being dispersed in a vehicle in a concentration sufficient to make a printable paste.

4,462,828

POLISHING AGENT COMPOSITION

Masaaki Otsuki, Isesaki, Japan, assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 13, 1983, Ser. No. 504,019
Claims priority, application Japan, Jul. 8, 1982, 57-117718
Int. Cl.³ C09G 1/08
U.S. Cl. 106—3 **11 Claims**

1. A polishing agent composition containing a polyorganosiloxane preparation comprising:

(A) from 4 to 40% by weight of a benzene soluble polyorganosiloxane resin comprising:

(1) 70 to 100 mole percent, $(R^1)_3SiO_{1/2}$ units and SiO_2 units, and

(2) 0 to 30 mole percent $(R^2)_2SiO$ units and having Si bonded OR^3 groups wherein R^1 and R^2 represent the same or different substituted or unsubstituted monovalent hydrocarbon groups and R^3 represents a hydrogen atom or a monovalent hydrocarbon group of from 1 to 6 carbon atoms;

(B) from 55 to 95% by weight of a liquid linear or branched polyorganosiloxane terminated by $(HO)(R^4)_2SiO_{1/2}$ units or $(R^4)_3SiO_{1/2}$ units, and whose units other than the terminal units comprise 90 to 100 mole percent $(R^5)_2SiO$ units and 0 to 10 mole percent

$(R^5)_aSiO_{4-a/2}$ units

where a equals 0 or 1, R^4 and R^5 represent the same or different substituted or unsubstituted monovalent hydrocarbon groups; and

(C) from 1 to 5% by weight of an amino group-containing alkoxysilane represented by the general formula:

$$(R^6O)_b-\overset{(R^7)_{(3-b)}}{\overset{|}{Si}}-(CH_2)_3NHR^8$$

wherein R^6 represents an alkyl group of from 1 to 4 carbon atoms, R^7 represents a substituted or unsubstituted monovalent hydrocarbon group, R^8 represents a hydrogen atom or an amino group-terminated aminoalkyl group of from 1 to 10 carbon atoms and b represents 2 or 3.

4,462,829

RUST CONVERTING AND RUST INHIBITING PRIMER

Adolf Heiss, P.O. Box 251, Richmond Hill, N.Y. 11419

Filed Apr. 14, 1983, Ser. No. 484,940
Int. Cl.³ C09D 3/64, 5/02, 5/08, 5/12
U.S. Cl. 106—14.05 **20 Claims**

1. A rust converting and rust inhibiting primer comprising an aqueous suspension or aqueous emulsion of an alkyd resin, about 150 to 275 parts by weight of pigment containing at least 50 parts by weight of red iron oxide pigment, the remainder being extender pigment, a drying accelerator for said alkyd resin composed of one or more polyvalent metal salts in an amount of about 0.5 to 1.5 parts by weight of said polyvalent metal and about 1 to 7 parts by weight of a surfactant active as an oil-and-water dispersant or emulsifier, all parts by weight being based on 100 parts by weight of said alkyd resin.

4,462,830

CORROSION INHIBITED COPPER NITRATE SOLUTIONS

Daniel V. Diep, Aurora, and David A. Grattan, Hinsdale, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 4, 1983, Ser. No. 520,262
Int. Cl.³ C09D 5/08
U.S. Cl. 106—14.14 **2 Claims**

1. A non-corrosive aqueous solution consisting essentially of at least 30% by weight of copper nitrate, from 1–5% by weight of boric acid based on the weight of the copper nitrate, and from 0.2–3.0% by weight of ethylenediaminetetraacetic acid based on the weight of the copper nitrate.

4,462,831

FIRE AND HEAT PROTECTION MATERIAL OF ABLATIVE TYPE

Vitaly Raevsky, and Gregory Svechinsky, both of Haifa, Israel, assignors to Raspik Ltd., Kiryat-Ata, Israel

Continuation-in-part of Ser. No. 165,980, Jul. 7, 1980, abandoned. This application Jul. 27, 1982, Ser. No. 402,324
Int. Cl.³ C09K 3/28
U.S. Cl. 106—18.26 **6 Claims**

1. A non-refractory ablative, fire- and heat-protection material for one time use, comprising an organic binder selected from the group consisting of natural and synthetic polymers, rubbers, natural and synthetic resins, natural and synthetic asphalts and bitumens including latexes, solutions of the above substances or mixtures thereof, and a filler consisting of hydrated aluminum sulfate of the general formula $Al_2(SO_4)_3.nH_2O$ wherein n=14–18 in an amount of more than 75% by weight of the material, said filler being free of any cementitious material.

4,462,832

LESS ABRASIVE PIGMENT OR PRINTING INK, AND METHOD OF REDUCING ABRASION CAUSED BY PIGMENTS AND PRINTING INKS

Werner Jettmar, Mannheim; Hans Olschner, Weinheim, and Helmut Junge, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,551

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047999

Int. Cl.³ C09D *11/02*

U.S. Cl. 106—23 3 Claims

1. An ink composition, comprising:

a pigment and from 0.01 to 10% by weight, based on the pigment, of zirconium oxide which has a Mohs hardness of from 4.5 to 8.

4,462,833

PROCESS FOR TREATING DIARYLIDE YELLOW PIGMENT

Byron G. Hays, Verona, and Philip L. Maguire, North Haledon, both of N.J., assignors to Inmont Corporation, Clifton, N.J.

Filed Dec. 27, 1982, Ser. No. 453,685

Int. Cl.³ C09D *11/00*

U.S. Cl. 106—23 13 Claims

1. A diarylide yellow pigment composition in which the diarylide yellow pigment has been treated with a polyamine, wherein the improvement comprises:

using as the polyamine a linear alkyl polyamine, said polyamine having the formula

$$R—NH—CH_2—CH_2—CH_2—_n NH_2$$

wherein R is a saturated or unsaturated alkyl group having at least 12 carbon atoms and n is at least 3, thereby producing such treated pigments which are easily dispersible in inks and show less penetration into and higher gloss on uncoated paper stock.

4,462,834

LADLE COVERING COMPOUND

Michael D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jun. 16, 1983, Ser. No. 504,817

Int. Cl.³ B28B *7/34*

U.S. Cl. 106—38.28 8 Claims

1. A metallurgical ladle covering compound capable of reacting with molten metal to form a rapidly and continuously expanding cover which exhibits a controlled continuing absorption of non-metallic inclusions from said molten metal consisting essentially of 56% to 60% by weight burnt lime, 22% to 30% by weight aluminum dross, 7% to 9% by weight fluorspar and 1% to 4% by weight acid treated graphite.

4,462,835

LIGHTWEIGHT BUILDING MATERIAL AND METHOD OF PRODUCING THE SAME

Martin Car, Grossenhausen-Linsengericht, Fed. Rep. of Germany, assignor to Otavi Minen AG, Frankfurt, Fed. Rep. of Germany

Filed Jul. 28, 1982, Ser. No. 402,820

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131548

Int. Cl.³ C04B *21/00*

U.S. Cl. 106—75 28 Claims

1. A lightweight building material, comprising an additive having from 70 to 85 volume percent of expanded perlite and having bulk density from 20 to 150 g/l and grain size from 0 to 6 mm, a bonding agent structure composed of from 2.5 to 23 volume percent of water glass, and from 0.1 to 1.0 volume percent of hardener, the bonding agent structure is porous with the pore content of between 80 and 99 percent by volume, the lightweight building material having the bulk density between 40 and 200 kg/m³ and the strength between 0.01 and 0.5N/mm².

4,462,836

CEMENT COMPOSITION AND METHOD OF CEMENT CASING IN A WELL

Wilford S. Baker, Thibodaux, La., and James J. Harrison, Glenshaw, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1983, Ser. No. 466,550

Int. Cl.³ C04B *7/352, 7/353*

U.S. Cl. 106—92 73 Claims

1. A novel cement composition for the preparation of a novel aqueous slurry useful in cementing casing in the borehole of a well comprising (1) cement, (2)(a) a hydroxyethylcellulose ether or (2)(b) a mixture of a hydroxyethylcellulose ether and a hydroxypropylcellulose ether, (3) at least one polysaccharide produced as a result of microbial action and (4) a dispersant.

4,462,837

CEMENT COMPOSITION AND METHOD OF CEMENT CASING IN A WELL

Wilford S. Baker, Thibodaux, La., and James J. Harrison, Glenshaw, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1983, Ser. No. 466,551

Int. Cl.³ C04B *7/353*

U.S. Cl. 106—93 43 Claims

1. A novel cement composition for the preparation of a novel aqueous slurry useful in cementing casing in the borehole of a well comprising (1) cement, (2) (a) a hydroxyethylcellulose ether having a viscosity above about 200 centipoises when measured in a five weight percent aqueous solution, but less then about 6000 centipoises when measured in a one weight percent aqueous solution or (2) (b) a mixture of a hydroxyethylcellulose ether having a viscosity above about 200 centipoises when measured in a five weight percent aqueous solution, but less than about 6000 centipoises when measured in a one weight percent aqueous solution and a hydroxypropylcellulose ether having a viscosity above about 100 centipoises when measured in a two weight percent aqueous solution, but less than about 10,000 centipoises when measured in a one weight percent aqueous solution, wherein said hydroxypropylcellulose ether is present in an amount up to about 20 weight percent based on the total weight of said hydroxyalkylcellulose ethers, and (3) a dispersant.

4,462,838

AQUEOUS ADHESIVE COMPOSITION USEFUL FOR LABELING BOTTLES

Johannes Andres, Düsseldorf; Rainer Hasenkamp, and Heinrich Merkel, both of Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Fed. Rep. of Germany

Division of Ser. No. 440,074, Nov. 8, 1982. This application Oct. 17, 1983, Ser. No. 542,749

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1981, 3146364; Feb. 13, 1982, 3205210; Feb. 13, 1982, 3205211

Int. Cl.³ C08L *89/00*

U.S. Cl. 106—139 27 Claims

1. An aqueous adhesion composition for mechanical labeling based upon starch derivatives and having a content of flow-regulating additives and, optionally, other customary additives, which comprises:

(a) at least one hydroxyalkyl ether of oxidized starch with a mean degree of substitution (MS) of ≦0.2, together with

(b) at least one polymer dissolved in the aqueous phase, the polymer being selected from the group consisting of water-soluble synthetic polymers, and casein.

4,462,839

ENTERIC COATING FOR PHARMACEUTICAL DOSAGE FORMS

Emanuel J. McGinley, Morrisville, and Domingo C. Tuason, Jr., Bensalem, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 16, 1983, Ser. No. 504,779
Int. Cl.³ C08L 1/08; A01N 25/00
U.S. Cl. 106—198 20 Claims

1. A process of making a polymeric powder which is readily dispersible in water to provide a composition useful for forming an entric coating on pharmaceutical dosage forms, comprising providing a freshly prepared aqueous dispersion of spherical water-insoluble enteric polymer particles, adding to said dispersion a phosphate salt in an amount sufficient to minimize coalescense of the particles during spray drying, thoroughly mixing, and spray drying to form the powder.

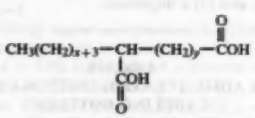
4,462,840

MIXING OF ASPHALT EMULSION AND AGGREGATE IN AQUEOUS BITUMINOUS EMULSION-AGGREGATE SLURRIES

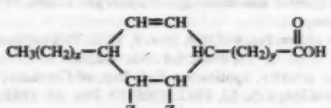
Peter Schilling, and Hans G. Schreuders, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,783
Int. Cl.³ C08L 95/00
U.S. Cl. 106—277 12 Claims

1. An improved process for preparing a paving slurry seal mixture of a cationic aqueous bituminous emulsion and mineral aggregate capable of being worked comprising mixing a densely graded mineral aggregate passing through No. 4 and at least 80% retained on 200 mesh screen, and from about 4% to about 16% water, based on the weight of the mineral aggregate, containing up to 3% of an inorganic or organic additive to reduce the setting time of the mixture to prewet the aggregate, and mixing the prewetted aggregate with from about 8% to about 20% of an oil in water type emulsion, based on the weight of the mineral aggregate, wherein the emulsion is comprised of from about 30% to about 80% bitumen, based on the weight of the emulsion, from about 0.1% to about 10% of a cation-active emulsifier based on the weight of the emulsion, wherein the emulsifier is selected from the group consisting of reaction products of one or more polyamines reacted with a polycarboxylic acid corresponding to the formulae



and



wherein x and y are integers from 3 to 9, x and y together equal 12, at least one Z is a carboxylic acid group and any remaining Z is hydrogen, and water to make up 100% by weight of the emulsion, the emulsion having a pH in the range of from 2–7, wherein the improvement comprises adding from 0.2% to 0.7% of one or more additives selected from the group consisting of polyamines, ammonia, magnesium sulfate, cupric sulfate, chromium chloride, ferric sulfate and dilute sulfuric acid to give cationic bituminous emulsions of extended mixing times.

4,462,841

SILVER-METAL OXIDE ALLOY ELECTRICAL CONTACT MATERIALS

Yukiei Miyakawa, Susono, Japan, assignor to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,509
Claims priority, application Japan, Apr. 23, 1982, 57-68475; Apr. 14, 1983, 58-66124
Int. Cl.³ C22C 5/08
U.S. Cl. 148—431 6 Claims

1. A silver-metal oxides alloy electrical contact material made by internally oxidizing an alloy consisting essentially of 3–9% Sn, 1–3% In, 0.2–3% Cd, 0.05–1% Ni, 0.3–0.8% Cu, the balance being Ag and incidental impurities, with the percents being by weight.

4,462,842

SURFACE TREATMENT PROCESS FOR IMPARTING HYDROPHILIC PROPERTIES TO ALUMINUM ARTICLES

Toshimitsu Uchiyama; Eizo Isoyama; Hiroichi Takenaka, and Masayuki Kaji, all of Sakai, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Jan. 5, 1982, Ser. No. 337,131
Claims priority, application Japan, Aug. 13, 1979, 54-103305; Jul. 7, 1980, 55-92962; Jul. 7, 1980, 55-92963
Int. Cl.³ C23F 7/00, 7/08; B05D 3/02
U.S. Cl. 148—6.15 R 5 Claims

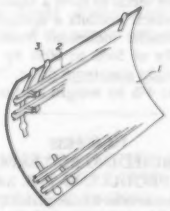
1. A surface treatment process for imparting hydrophilic properties at least onto fin surfaces of an aluminum evaporator consisting of a first step of forming a chemical coating over the surface of the aluminum thereof by treating the aluminum with a solution of zirconium fluoride, and a second step of forming a hydrophilic layer over the coating by treating the resulting aluminum article with a solution of colloidal silica.

4,462,843

METHOD FOR PRODUCING FINE-GRAINED, HIGH STRENGTH ALUMINUM ALLOY MATERIAL

Yoshio Baba, and Teruo Uno, both of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,058
Claims priority, application Japan, Mar. 31, 1981, 56-46523
Int. Cl.³ C22F 1/04
U.S. Cl. 148—11.5 A 10 Claims



1. A method for producing a fine-grained, high strength aluminum alloy material having a grain size not exceeding 100 μm comprising the steps of:

homogenizing an aluminum base alloy consisting essentially of 5.1 to 8.1 wt.% Zn, 1.8 to 3.4 wt.% Mg, 1.2 to 2.6 wt.% Cu, up to 0.2 wt.% Ti and at least one of 0.18 to 0.35 wt.% Cr and 0.05 to 0.25 wt.% Zr, the balance being aluminum and impurities;

hot rolling said alloy while coiling said alloy to form a hot rolled coiled alloy sheet;

cold rolling said coiled sheet to a given thickness;

annealing said coiled sheet in a continuous annealing furnace by rapidly heating said coiled sheet to a temperature of

400° to 500° C. at an average heating rate exceeding 50° C./min, maintaining said coiled sheet at said temperature for a period of 10 seconds to 10 minutes, said coiled sheet being kept under stress by applying a tension not exceeding 2 kg/mm² thereto during said annealing step;

cold working said sheet to a rolling reduction of 0 to 90%; and solution heat treating said sheet.

4,462,844

PROCESS FOR MANUFACTURING HOT EXTRUDED ALLOY PRODUCTS

Tsunetoshi Takahashi; Masao Suzuki, and Tadayuki Okinaka, all of Hikarishi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,978
Claims priority, application Japan, Jul. 24, 1981, 56-115227
Int. Cl.³ C21D *7/04, 7/06*
U.S. Cl. 148—12 E **8 Claims**

1. A process for producing a hot extruded alloy product, comprising:

cold working the surface of a continuously cast stainless steel or super alloy billet;

heating the cold worked billet to provide a fine structure in its surface layer; and

hot extruding the resultant billet.

4,462,845

OXYGEN-FREE DISPERSION-STRENGTHENED COPPER AND PROCESS FOR MAKING SAME

Erhard Klar, Beachwood; Anil V. Nadkarni, Mentor, and Prasanna K. Samal, Lyndhurst, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Feb. 17, 1982, Ser. No. 349,508
Int. Cl.³ C21D *1/44*
U.S. Cl. 148—13.2 **6 Claims**

1. A process for producing deoxidized dispersion-strengthened copper which comprises:

subjecting particulate crude dispersion-strengthened copper to partial reduction at a temperature of 1400° F. to 1800° F. with a reducing gas having a dew point of about 0° to minus 50° F. until the available oxygen content in said crude copper has been lowered to about 100 to 500 ppm, thereby providing a low-oxygen intermediate copper; and

thermally inducing sequestration of substantially all of the remaining available oxygen in said intermediate copper with a minute proportion of diffusible oxygen getter at elevated temperature, said proportion being in excess of, but not substantially more than about double that which is stoichiometric for combining with all of the available oxygen remaining in said intermediate copper.

4,462,846

SEMICONDUCTOR STRUCTURE FOR RECESSED ISOLATION OXIDE

Ramesh C. Varshney, 2622 Ohlone Dr., San Jose, Calif. 95132

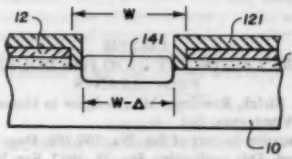
Division of Ser. No. 83,346, Oct. 10, 1979, Pat. No. 4,272,308.
This application Jan. 29, 1981, Ser. No. 229,542
Int. Cl.³ H01L *21/31*
U.S. Cl. 148—33.2 **1 Claim**

1. A semiconductor structure which permits the growth of at least one recessed oxide region while restricting undesired bird-beak extension growth of said recessed oxide region comprising:

a substrate including a first major surface;

an oxide layer on said substrate having at least one opening therein;

a silicon nitride layer located on said oxide layer, said silicon nitride layer having a single upper surface uniformly spaced from said first major surface of said substrate and provided with a connecting substantially vertical sidewall



portion in contact with said oxide layer surrounding said opening; and

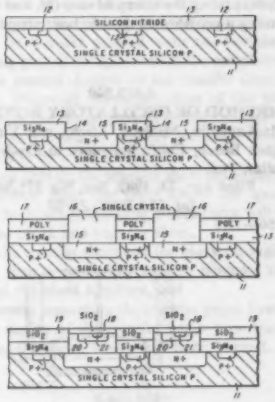
a recessed oxide region in said substrate, said recessed oxide region having a portion extending within and being bounded by said vertical sidewall portion of said silicon nitride layer.

4,462,847

FABRICATION OF DIELECTRICALLY ISOLATED MICROELECTRONIC SEMICONDUCTOR CIRCUITS UTILIZING SELECTIVE GROWTH BY LOW PRESSURE VAPOR DEPOSITION

Stephen W. Thompson, Rosenburg, and Ralph Keen, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 21, 1982, Ser. No. 390,011
Int. Cl.³ H01L *21/205, 21/76*
U.S. Cl. 148—174 **5 Claims**



1. A method for the fabrication of a semiconductor device comprising the steps of:

(a) forming a patterned layer of silicon nitride on the surface of a monocrystalline semiconductor body;

(b) contacting said body and patterned layer with a vaporous or gaseous semiconductor compound at a pressure between 1 torr and 100 torr, at a temperature between 700° C. and 1420° C. to cause selective epitaxial deposition of monocrystalline semiconductor on said body, and concurrent deposition of polycrystalline semiconductor on said patterned layer;

(c) controlling the ratio of mono to poly growth rates to obtain substantially faster growth of mono than poly;

(d) continuing such growth until the single crystal deposit

becomes substantially thicker than the combined thickness of the nitride plus the poly deposited thereon;

(e) oxidizing the combined deposits, until the poly deposit is substantially fully oxidized, at which time the oxide surface of the oxidized mono becomes substantially coplanar with the oxide surface of the oxidized poly;

(f) then fabricating one or more components in the mono deposit.

4,462,848

SLURRY CASTING METHOD FOR DOUBLE BASE PROPELLANTS

Donald E. Elrick, Rawlings, Md., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 108,268, Dec. 28, 1979, abandoned. This application Jan. 25, 1982, Ser. No. 342,272

Int. Cl.³ C06B *45/10*

U.S. Cl. 149—19.92 **3 Claims**

1. A process for preparation of slurry cast propellant compositions which exhibit improved burning rates, said process comprising (a) preparing an initial propellant slurry comprising a casting solvent, low viscosity nitrocellulose containing 12% nitrogen by weight, a polyol having a molecular weight of from about 2000 to about 6000 and a hydroxyl functionality of from about 2 to about 3, a polyfunctional isocyanate crosslinking agent, and solid oxidizing agents selected from organic nitramines and organic nitro compounds; (b) admixing double base casting powder granules with said propellant slurry, said casting powder granules comprising from about 10% to about 25% by weight, based on the weight of the resulting propellant slurry, said casting powder granules containing from about 20% to about 75% ammonium perchlorate having a particle size range of from about 0.5 micron to about 3.0 microns provided that if about 50% of the ammonium perchlorate in said granules has a particle size of about 0.5 micron the total perchlorate content of said casting powder shall not exceed 65% by weight; (c) casting the slurry of step (b), and (d) curing said slurry forming a crosslinked double base propellant composition.

4,462,849

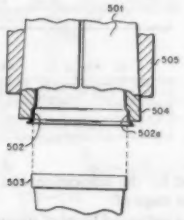
METHOD OF OSCILLATORY BONDING

Donald MacLaughlin, Midland, Mich., and Vincent Fortuna, Huntington Beach, Calif., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Apr. 23, 1982, Ser. No. 371,363

Int. Cl.³ B29C *27/08*

U.S. Cl. 156—73.5 **12 Claims**



1. A method of welding at least two similarly configured themoplastic sections together having relatively tight-fitting complementary joinder portions, said method comprising:

sliding said tight-fitting portions together into telescopic conjoinment;

oscillating said portions axially with respect to each other at a sufficiently rapid rate and for a sufficient period of time to generate enough heat to melt the areas of contact therebetween; and,

bringing said sections into a final desirable position and allowing said heated areas to cool, thereby welding said sections together.

4,462,850

PROCESS OF AND APPARATUS FOR MANUFACTURING BLADDERS USED FOR TIRE BUILDING MACHINE

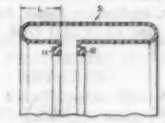
Takeshi Fukunaga, Mitaka, and Kunio Tajima, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

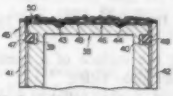
Filed Nov. 8, 1982, Ser. No. 439,814

Claims priority, application Japan, Nov. 9, 1981, 56-179246

Int. Cl.³ B29H *5/18*

U.S. Cl. 156—110.1 **1 Claim**





1. A process of manufacturing a bladder which is to be disposed on each of axially opposite end portions of a tire building machine having a tire building drum, respectively, and employed for turning back a ply cord bound on the tire building drum of the tire building machine, comprising of the steps of:

binding a bladder material on a cylindrical member, the bladder material being reinforced with cords and unvulcanized, the cylindrical member having two annular grooves formed in the outer peripheral portion thereof,

binding a cloth belt containing water around the outer peripheral surface of said bladder material so that said bladder material is shaped conformingly to the outer peripheral portion of said cylindrical member and said two annular grooves,

vulcanizing in a vulcanizing vessel said bladder material to form two annular ridges on said bladder material conformingly to the shape of said annular grooves, and

taking out said bladder material from the vulcanizing vessel and turning back said bladder material around the lines of said annular ridges formed on said cylindrical member in such a manner that said annular ridges protrude outwardly of said bladder material.

4,462,851

METHOD FOR TAXING CIGARETTE PACKS AND VALIDATING CIGARETTE CARTONS

Gilbert Colgate, Jr., New York, N.Y., assignor to United States Banknote Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 434,830

Int. Cl.³ B65B *6/00*; B29C *17/04*; B32C *31/00*; B32B *3/04*

U.S. Cl. 156—212 **11 Claims**

1. A method of stamping, for taxing purposes, individual cigarette packs in a carton of cigarettes wherein said carton includes a container having bottom flaps so as to close a bottom side of said container in a longitudinal direction and at least ten cigarette packs housed in said container in two longitudinal groupings of five packs each, said method comprising steps of:

(a) selecting a sheet having at least two rows and five columns, said rows and columns thereby defining discrete

labels each bearing tax indicia, opposing end labels of said rows including a distal portion extending in the longitudinal direction a predetermined dimension;

(b) separating each of said labels while simultanesouly maintaining spatial integrity of said columns and rows;

(c) transferring said labels separated according to step (b)

onto said cigarette packs so that said portions extend beyond opposing peripheral edges, respectively, of said container, said labels corresponding to said longitudinal grouping of five packs each;

(d) affixing said labels to said packs thereby establishing that said packs have been taxed by proper taxing authority; and

(e) securing said portions to exterior sides of said container.

4,462,852

PROCESS FOR COLORING (PRINTING) OF WEB-LIKE OBJECTS, ESPECIALLY SKI COVERINGS, AS WELL AS SIMILAR OBJECTS

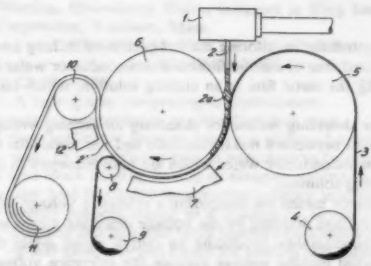
Horst Castor, Traunstein, Fed. Rep. of Germany, assignor to C P Components GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,792

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004518

Int. Cl.³ B29B *3/00*

U.S. Cl. 156—231 **20 Claims**



1. A process for printing of web objects especially ski coverings from thermo-plastics, such as olefins including high and low pressure polyethylene wherein the side of the covering to be printed is subjected to heat to obtain fusion of the printing from a printing carrier which has been covered with a printing pattern of a color pigment adapted to transfer under the influence of heat from the carrier to the web object and as a result first of sublimation and then of diffusion, comprising moving an elongated print carrier along a predetermined path, moving a web object adapted to form a hard foil and with said object in a state of melt continuously into contact with said print carrier and essentially along a narrow area strip perpendicular to the common direction of the conveying of the web object and the print carrier, and including rapidly transferring of the printing unto said object in said state of melt by sublimation and then by diffusion along said narrow area strip.

4,462,853

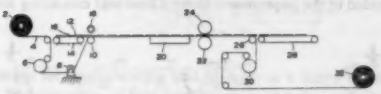
TRANSFER PRINTING FLOOR TILE

Richard M. Ringer, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 27, 1982, Ser. No. 424,757

Int. Cl.³ B44C *1/16*; B32C *31/00*; B29C *19/00*; B65H *29/24*

U.S. Cl. 156—238 **2 Claims**



1. A process for transfer printing blanks of material having a periphery comprising the steps of:

(a) passing only a transfer sheet with designs thereon, an upper surface and a periphery down a process line in a horizontal plane with the transfer sheet being positioned so that a series of repeat pattern designs thereon are positioned on the upper surface of the transfer sheet as it moves in said aforementioned horizontal plane,

(b) depositing on the upper surface of the transfer sheet the blank to be transfer printed with the periphery of the blank being placed in register with the periphery of one of the repeat pattern designs on the transfer sheet,

(c) visually observing the registration of the blank to be printed with the repeat pattern of the transfer sheet,

(d) holding said blank in register with the design on the transfer sheet by a static charge,

(e) conveying only on the transfer sheet as the carrier for the blank thereon from the time where the transfer sheet receives the blank to the time where there will be lamination of the blank and transfer sheet,

(f) passing the transfer sheet and the blank through a heating step and then a laminating step to laminate the transfer paper and the blank together, and

(g) subsequently separating the transfer paper from the blank with the design of the transfer paper now transferred in register to the blank which was to be printed.

4,462,854

PROCESS AND APPARATUS FOR MAKING A MULTI-POCKETED ALBUM PAGE

Roger A. Wenstrom; Donald E. Irvin, St. Cloud, both of Minn.; George L. MacKay, Hingham, and Hugh A. Robinson, Burlington, both of Mass., assignors to William W. Holes, St. Cloud, Minn.

Filed Sep. 21, 1983, Ser. No. 534,417

Int. Cl.³ B32B *31/08*

U.S. Cl. 156—250 **7 Claims**

1. Apparatus for making a multipocketed album page for photograph albums, comprising:

means revolvably supporting a roll of paperboard, said paperboard having parallel longitudinal edges and being wound into a tight roll;

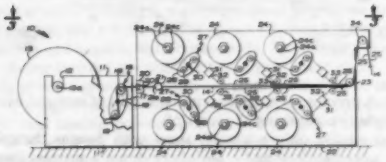
means revolvably supporting a plurality of substantially

identical strips of transparent flexible plastic, each strip of plastic having parallel longitudinal edges and having a width dimension substantially less than the width dimension of the paperboard;

driven means gripping one end of the paperboard and one end of each strip of plastic to simultaneously unwind the paperboard strips of plastic and move the same through a predetermined path of travel;

means guiding the strips of plastic in contacting relation with the surfaces of the paperboard during said travel, said guiding means causing a plurality of the strips to engage one surface of the paperboard in side-by-side spaced apart relation, and causing a plurality of said strips to engage the other surface of the paperboard in side-by-side spaced apart relation, one plastic strip which engages one surface of the paperboard being disposed in opposed registering relation with a plastic strip engaging the other surface of the paperboard;

heat sealing means extending longitudinally of the plastic strips and paperboard being positioned on the opposite sides of and along the path of travel of the plastic strips and paperboard, said longitudinal heat sealing means engaging said strips and causing each said strip to be heat sealed to the paperboard along a heat seal extending longi-



tudinally of the plastic strip and paperboard whereby a strip engaging one surface of the paperboard will be heat sealed to the latter along a heat seal zone disposed in registering relation with the heat seal zone of a strip engaging the other surface of the paperboard;

transverse heat sealing means extending transversely of the paperboard and strips and being positioned on opposite sides of and along the path of travel of the plastic strips and paperboard, said transverse heat sealing means engaging said strips and causing each strip to be heat sealed to the paperboard along longitudinally spaced apart transversely extending heat seal zones whereby a strip engaging one surface of the paperboard will be heat sealed to the latter along a transverse heat seal zone disposed in registering relation with a transverse heat seal zone of the strip engaging the other surface of the paperboard;

shiftable shearing means positioned on the path of travel of the strips and paperboard and located downstream of said transverse sealing means, said shearing means being operable to successively cut the paperboard and strips through each transverse heat sealing zone to consecutively form album pages each having a plurality of transparent pockets on each surface thereof, each pocket being defined by each strip heat sealed along three edges of the latter to the paperboard.

4,462,855

PROCESS FOR BONDING POLYESTER REINFORCEMENT ELEMENTS TO RUBBER

Anthony W. Yankowsky, Fort Mill, S.C.; Harry W. Stanhope, Charlotte, N.C., and Darrell D. Hicks, Jeffersontown, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Jun. 28, 1982, Ser. No. 393,218

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.3 **10 Claims**

1. The process of bonding polyester reinforcement fibers to rubber consisting essentially of:

providing polyester reinforcement fibers bearing a coating consisting essentially of an organic solution of a dissolved aromatic urethane having the formula $Ar(NHCOX)_n$ wherein Ar is an organic residue containing at least one aromatic nucleus, X is a moiety selected from the group consisting of alkoxy, aryloxy and alkaryloxy and n is greater than about 2;

said aromatic urethane exhibiting thermal disassociation at a temperature in the range of between 220° F. and about 465° F., thereby forming an aromatic isocyanate;

said dissolved aromatic urethane solution additionally comprising a flexibilizing agent in an amount of between 5 and about 50 percent by weight based on the weight of said aromatic urethane and being substantially free of free isocyanate;

coating said polyester reinforcement fibers bearing said dissolved urethane coating with a latex comprising resorcinol-formaldehyde resin, heating said latex coated fibers to a temperature in the range of between about 220° F. and about 480° F. and above the thermal disassociation temperature of said aromatic urethane, and applying to and curing a layer of rubber on said treated polyester reinforcement fibers.

4,462,856

SYSTEM FOR ETCHING A METAL FILM ON A SEMICONDUCTOR WAFER

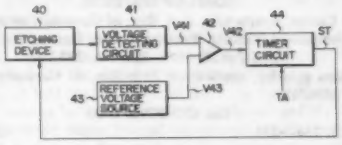
Masahiro Abe, Yokohama; Toshio Yonezawa, Yokosuka; Masaharu Aoyama, Fujisawa, and Takashi Ajima, Kamakura, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 17, 1983, Ser. No. 467,298

Claims priority, application Japan, Feb. 18, 1982, 57-25012

Int. Cl.³ C23F *1/02*; **C25F** *3/04, 3/12*

U.S. Cl. 156—345 **3 Claims**



1. A system for monitoring the completion of etching away of a selected area of a metal film on a semiconductor wafer by immersing the metal film in an etching solution, which comprises:

voltage detecting means for detecting an etching voltage created between a metal electrode and the metal film on the semiconductor wafer which are both immersed in the etching solution;

comparator means for comparing a reference voltage with the voltage detected by the voltage detecting means and for continuously producing an output signal while the detected etching voltage exceeds the reference voltage; and

timer means for starting a time count operation upon receipt of the output signal from the comparator means and for producing an etching completion signal when the output signal ceases.

4,462,857

APPARATUS FOR TREATING AND SEVERING SECTIONS FROM INTERMITTENTLY FED WEBS

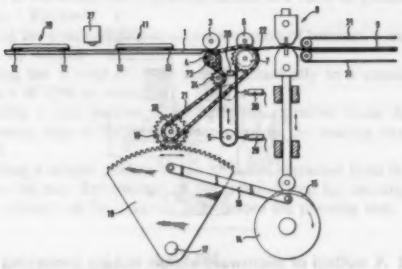
Friedhelm Mundus, Lengerich, and Heinrich Lippmann, Recke, both of Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jan. 25, 1983, Ser. No. 460,787

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202337

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—361 6 Claims



1. Apparatus for treating and severing sections from intermittently fed webs, preferably for welding pairs of handles onto the edges of semi-tubular webs of thermoplastic material and severing bags therefrom by transverse weld seams, comprising intermittent feeding means for the web, transverse severing means for severing sections from the web during standstill periods thereof, and treating means upstream thereof, characterised in that the upstream treating means (10, 11) extend over a length of web corresponding to several lengths of sections and carry out like processes on the eventual sections during a standstill period of the web, that between the treating means (10, 11) and the transverse severing means (8) there are two spaced intermittently driven pairs of feed rollers (3, 4; 6, 7) of which the upstream pair feeds the web during each feeding interval by a web length corresponding to the number of treated sections and the downstream pair feeds the web by one section length during feeding intervals of which the cycle is higher by the number of sections to be treated, and that between the pairs of feed rollers (3, 4; 6, 7) there are storing means (5) which store the web length fed by the upstream feed roller pair (4, 3) but not yet taken up by the downstream pair (6, 7).

4,462,858

SPLICER TAPE FEED MEANS

Louis J. Goguen, New Brunswick, Canada, and George M. Woodley, Shrewsbury, Mass., assignors to King Instrument Corporation, Westboro, Mass.

Filed Mar. 11, 1983, Ser. No. 474,460

Int. Cl.³ B65H *21/00*

U.S. Cl. 156—506 15 Claims

1. A tape splicer comprising in combination:

means for supporting a supply of splicing tape;

a tape applicator plunger having a surface for pressing a piece of said splicing tape to two tapes to be spliced;

a feed block housing having an elongate guideway;

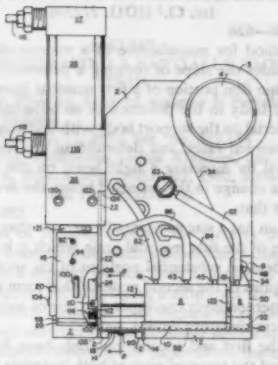
a tape feed block for transporting splicing tape from said supply support means to a position in advance of said plunger, said tape feed block having a rib slidably received in said guideway and means for holding said splicing tape by suction to said rib;

means supporting said feed block for reciprocal motion relative to said feed block housing toward and away from said plunger;

means for reciprocating said feed block relative to said feed block housing;

means attached to said plunger for cutting a predetermined length of said splicing tape advanced by said feed block;

means on said plunger for allowing a predetermined length of said splicing tape to be held to said plunger surface by suction; and



means for reciprocating said plunger in a timed relation to reciprocation of said feed block so that said splicing tape transported by said feed block from said tape supply to said position in advance of said plunger surface is (1) severed by said cutting means, and (2) applied to said two tapes by said reciprocating plunger.

4,462,859

ARMATURE WINDING

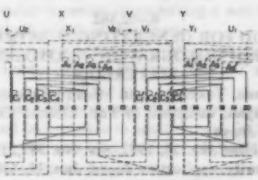
Kenichi Nakamura, Sakura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1980, Ser. No. 156,610

Claims priority, application Japan, Jun. 27, 1979, 54-80184

Int. Cl.³ H02K *3/00*

U.S. Cl. 310—198 4 Claims



1. A winding structure of an armature in a rotary machine, said structure comprising a plurality of coil assemblies each having a pair of lead-out conductors and each being composed of a plurality of coils wound in a core of said armature, said coils of each coil assembly being wound concentrically with different pitches from one another and wound continuously in series according to the order of the magnitude of the pitch, said pair of lead-out conductors being connected respectively to the ends of said continuously serially-wound coil assembly and being disposed only at the opposite sides of the coil having the largest pitch.

4,462,860

END POINT DETECTION

Charles R. Szmanda, Bethlehem, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 381,148, May 24, 1982, abandoned. This application Dec. 20, 1982, Ser. No. 451,029

Int. Cl.³ H01L *21/306*

U.S. Cl. 156—626 2 Claims

1. A method for manufacture of a microminiature device which includes the steps of forming a patterned layer by removing a thin film portion of a first material from an underlying support body in the presence of an adjacent region of a second material on the support body with said materials having different removal rates, and determining the removal of the first material by directing a light beam on the material and measuring a change in the reflected beam, the invention characterized in that:

a. the beam has a size substantially greater than the thin film portion of the first material upon which it is incident and is incident on substantial portions of the second material,

b. the regions of the second material that form the pattern in the patterned layer correspond to one or more features of the microminiature device, and

c. both the first and second materials have finite removal rates and the removal rates of both materials are sufficient to produce oscillations in the portion of the beam reflected from said adjacent region.

4,462,861

ETCHANT WITH INCREASED ETCH RATE

June L. McClean, Hudson, N.H., assignor to Shipley Company Inc., Newton, Mass.

Filed Nov. 14, 1983, Ser. No. 551,037

Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—640 27 Claims

1. A process for the manufacture of a printed circuit board comprising the step of contacting a copper clad printed circuit board base material, having an etch resist over the surface of the copper defining a circuit pattern, with an etchant for a time sufficient to remove all exposed copper, said etchant comprising an aqueous solution of a peroxide and sulfuric acid, each in an amount sufficient to provide a sustained rate of etching, and propionic acid in an amount sufficient to exalt the etch rate to a rate in excess of that achievable by the peroxide-sulfuric mixture alone.

4,462,862

METHOD FOR GENERATING SUBSTRATES OF ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Toyoki Kazama, Yokosuka, and Michiro Shimatani, Fujisawa, both of Japan, assignors to Fuji Electric Company, Ltd., Kawasaki, Japan

Filed Jun. 10, 1982, Ser. No. 387,219

Claims priority, application Japan, Jun. 15, 1981, 56-91752

Int. Cl.³ C23F *1/00*; B44C *1/22*

U.S. Cl. 156—643 3 Claims

1. A method for regenerating the substrate of an electrophotographic photosensitive element which includes an amorphous silicon layer coated on a metal surface to provide a clean metal substrate for reuse in a photosensitive element comprising providing an atmosphere containing fluorine at reduced pressure in contact with the amorphous silicon layer, generating a plasma in the fluorine-containing atmosphere, reacting the plasma with the amorphous silicon layer to produce a gaseous silicon compound, and maintaining the plasma in contact with the surface of the element until all of the amorphous silicon has been removed.

4,462,863

MICROWAVE PLASMA ETCHING

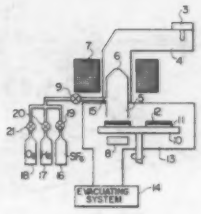
Shigeru Nishimatsu, Kokubunji; Keizo Suzuki, Hachioji; Ken Ninomiya, Tokyo; Ichiro Kanomata, Fuchu; Sadayuki Okudaira, and Hiroji Saida, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 298,583, Sep. 2, 1981, abandoned. This application Jan. 19, 1983, Ser. No. 459,240

Claims priority, application Japan, Sep. 10, 1980, 55-124521

Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 12 Claims



1. A method of microwave plasma etching comprising the steps of:

introducing a discharge gas into a vacuum chamber which defines a discharge space, the discharge gas including a mixture of fluorine-containing gas, oxygen gas and hydrogen gas;

applying a microwave electric field and a magnetic field to said discharge gas in the discharge space, thereby to generate a plasma; and

injecting activated particles in said plasma to at least one workpiece placed in said vacuum chamber, thereby to etch a surface of said at least one workpiece, whereby the inclusion of both oxygen gas and hydrogen gas in the discharge gas permits etching to be performed with substantially no side etching, while preventing reduction of the etching rate.

4,462,864

PROCESS FOR THE DELIGNIFICATION OF UNBLEACHED CHEMICAL PULP

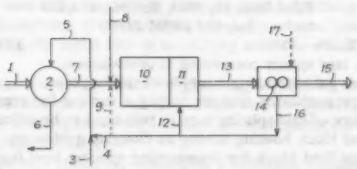
Jacques Carles, Saint Grandens, and Henri Lemoyne, Montmedy, both of France, assignors to Groupement Europeen de la Cellulose, Paris, France

Continuation of Ser. No. 139,198, Apr. 11, 1980, abandoned. This application Apr. 14, 1982, Ser. No. 368,142

Claims priority, application France, Apr. 17, 1979, 79 09642; Mar. 31, 1980, 80 07170

Int. Cl.³ D21C *9/16*

U.S. Cl. 162—56 12 Claims



1. A process for the delignification of unbleached Kraft pulp comprising the steps of:

washing the unbleached Kraft pulp;

diluting the washed pulp by the addition of part of the effluents extracted from the pressing step following the oxidation step to provide a quantity of dissolved materials of between 0.5% and 5% by weight with respect to the pulp;

treating the diluted unbleached Kraft pulp with a peroxide in

an alkaline medium without using bleaching agents containing chlorine and without the addition of inorganic buffers or cellulose preservatives, to oxidize and fragment lignin molecules in the pulp, with a percentage ratio of peroxide with respect to the pulp per unit of Kappa index of said pulp between 0.01 and 0.1, with a pH between 10 and 12, at a temperature between 70° and 95° C., during a period of time between 20 minutes and 3 hours, while

keeping during the oxidation step an autogenous overpressure slightly greater than atmospheric in the column of pulp by carrying out the reaction in a closed reactor, the overpressure in the column of pulp being limited to a value no greater than 2 Kg/cm^2;

diluting the oxidized pulp to a concentration of between 1 and 5% by weight;

pressing the diluted oxidized pulp mechanically to a consistency of 30% or more;

recycling a first portion of the effluents extracted from the pressing step to the dilution step prior to the treating step; and

recycling a second portion of the effluents extracted from the pressing step downstream of the treating step for ensuring the dilution of the oxidized pulp before the pressing step.

4,462,865
DELIGNIFICATION OF LIGNOCELLULOSIC MATERIALS WITH 2-IMIDAZOLIDINONES AND 2-OXAZOLIDINONES

Wilhelm E. Walles, Freeland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1981, Ser. No. 307,350
Int. Cl.³ D21C *3/20*
U.S. Cl. 162—72 **17 Claims**

15. A process for the delignification of lignocellulosic material comprising contacting at a temperature of from about 200° C. to about 250° C. a lignocellulosic material with at least one compound selected from the group consisting of a 2-oxazolidinone, or a lower alkyl derivative thereof, or a 2-imidazolidinone, or a lower alkyl derivative thereof, or a hydroxy-(lower alkyl)-2-imidazolidinone, under conditions such that the lignocellulosic material may be separated into a lignin-enriched phase and a cellulose-enriched pulp phase, with the proviso that the weight ratio of lignocellulosic material to 2-oxazolidinone or 2-imidazolidinone is about 1:0.1 or higher.

4,462,866
SHEET MATERIALS

Alan J. Tooth, Whitchurch, and Neil Pask, Newbury, both of England, assignors to Portals Limited, Hampshire, England

Filed Feb. 18, 1982, Ser. No. 350,027
Claims priority, application United Kingdom, Feb. 19, 1981, 8105278; Jul. 13, 1981, 8121563
Int. Cl.³ D21D *3/00*
U.S. Cl. 162—103 **9 Claims**

1. A method for making a sheet of paper for security documents by drawing fibres from a liquid suspension of fibres through a forming support surface and depositing them onto said forming support surface which method comprises disposing a continuous elongate security element on the forming support surface which forming support surface is modified so that as fibres are drawn from the suspension onto the forming support surface the elongate security element becomes generally incorporated in the sheet but is left at least substantially exposed at at least one surface of the sheet at a plurality of spaced locations wherein the modified forming support surface has portions which are raised relative to adjacent areas of the surface, and the elongate element is disposed to extend over the raised portions, the deposition of fibres being in such a manner that substantially no fibres are deposited between the raised portions and the overlying elongate element, whereby the elongate element becomes generally disposed within the thickness of the sheet formed by the deposited fibres but at least substantially exposed at least one surface of the sheet at a plurality of spaced locations.

4,462,867
PAPER INCORPORATING A PARTIALLY EMBEDDED STRIP

James S. Fuller, Platford, England, assignor to Portals Limited, Hampshire, England

Filed Jul. 12, 1982, Ser. No. 397,158
Claims priority, application United Kingdom, Jul. 13, 1981, 8121564; Dec. 9, 1981, 8137104; Mar. 22, 1982, 8208348
Int. Cl.³ D21D *3/00*
U.S. Cl. 162—103 **9 Claims**

1. A method of forming a paper for security documents which method comprises depositing paper fibres from a liquid suspension onto a support surface from a furnish by drainage through the support surface, laying a strip over the deposited paper fibres, which strip has first regions of predetermined shape which will obstruct further drainage sufficiently to prevent any substantial deposition of paper fibres thereover and second regions which will obstruct further drainage insufficiently to prevent further deposition of paper fibres thereover, and depositing further paper fibres by drainage through said second regions and support surface so as to form a paper having the strip in part embedded therein and in part exposed on one surface thereof, the embedded part corresponding with said second regions and the exposed part corresponding with said first regions.

4,462,868
PAPER WEB DRYING APPARATUS HAVING A HOOD WITH TWO SECTIONS

Terence J. Oubridge, Wylam, and Ben Boorman, Hexham, both of England, assignors to Kimberly-Clark Limited, Kent, England

Filed Apr. 26, 1982, Ser. No. 371,779
Claims priority, application United Kingdom, Apr. 27, 1981, 8112967
Int. Cl.³ D21C *5/02, 5/18*
U.S. Cl. 162—280 **9 Claims**

1. Paper web drying apparatus comprising:

a hollow, rotatably mounted drum having a web supporting surface through which air may pass;

a hood surrounding said drum between a web inlet and web outlet, said hood extending for more than 180° around said drum;

means to divide said hood into at least two sections, said sections fixed one relative to another, said first hood section adjacent the web inlet having a plurality of nozzles connected to a source of pressurized heated air and having interspersed among said apertures a plurality of ducts in the peripheral direction communicating between the surface of said web and exhaust means, the last of said hood sections adjacent the web outlet and connected to said source of pressurized heated air but having no communication with said exhaust means, said pressurized heated air in the last of said hood sections passing through a perforated plate to said web,

and

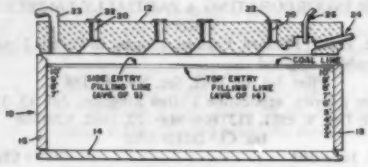
evacuating means connected to the interior of said hollow drum, said evacuating means adapted to withdraw wet air and stem from said drum interior and to maintain a reduced pressure therein.

4,462,869

PIPELINE CHARGING ENTRY INTO COKE OVENS

Rufus F. Davis, Jr., Kenwood, Ky.; Donald G. Marting, Murray Hill, N.J., and Harvey S. Auvil, Ashland, Ky., assignors to Krupp Wilputte Corporation, Murray Hill, N.J.

Filed Apr. 25, 1977, Ser. No. 790,212
Int. Cl.³ C10B *31/04, 45/00*
U.S. Cl. 201—40 **2 Claims**



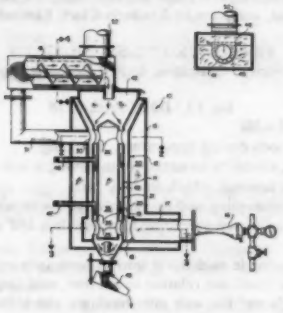
1. In a method of charging a coking chamber defined within an enclosure by conveying through the enclosure and into the chamber a stream of preheated coal particles carried by an inert carrier gas within an enclosed pipeline and discharging a mixture of coal particles and carrier gas from the end of the pipeline into the upper part of the chamber in a manner such that the coal particles spread throughout the chamber and settle out of the carrier gas, the improvement comprising passing the stream as it approaches the enclosure through a curved path which becomes straight and then becomes curved in an opposite mode with respect to said curved path and discharging said mixture into said chamber axially from the end of the pipeline in a vertically downwardly direction which is not greater than 30° from a vertical direction.

4,462,870

LOW TEMPERATURE KILN

Robert A. Wilson, and J. Leroy Peterson, both of Salt Lake City, Utah, assignors to Custom Equipment Corporation, Salt Lake City, Utah

Filed May 24, 1982, Ser. No. 381,426
Int. Cl.³ B01J *4/00, 8/12*; C10B *47/20*; F27B *1/20*
U.S. Cl. 202—124 **9 Claims**



1. A kiln, comprising:

a metallic vessel with inner and outer walls which cooperatively define an approximately annular heating zone surrounding an interior space defined by said inner wall;

means for introducing particulate material to the top of said vessel and for discharging said material from the bottom of said vessel at a controlled rate so that material introduced to the top migrates down through the heating zone during a selected residence time, said means constituting the sole means of access of fluid materials into said heating zone; and

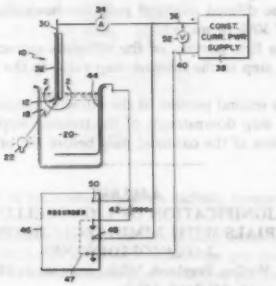
means for heating the inner and outer walls of said heating zone to a selected temperature below the softening point of the vessel while avoiding direct contact of material within the heating zone with any externally generated heating medium.

4,462,871

EPITAXIAL THINNING PROCESS

Clifford M. Siegel, Charlottesville, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 6, 1982, Ser. No. 366,103
Int. Cl.³ C25D *11/32*
U.S. Cl. 204—1 T **11 Claims**



1. In a process for thinning a layer that lies on a substrate of a wafer, by passing a current from the substrate through the layer and into an electrolyte while shining light on the layer, to form an oxide film between the layer and electrolyte, a method for determining the breakdown voltage of diodes to be made from the wafer comprising:

establishing the wafer in an electrolyte and applying a constant current between the wafer substrate and electrolyte, switching between the shining of light on said layer and the avoidance of shining light, and measuring a sudden change in voltage between a location on the substrate and the electrolyte, that accompanies the switching, and

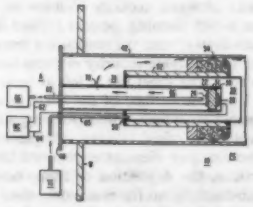
stopping the process of applying current when the voltage change is approximately the same as the desired breakdown voltage of diodes to be made from the wafer.

4,462,872

METHOD OF OPERATING A GAS ANALYZER AND SOLID ELECTROLYTE GAS SENSING APPARATUS

Robert L. Nelson, Orrville, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 294,951, Aug. 21, 1981, abandoned. This application Nov. 16, 1982, Ser. No. 442,073
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—1 T **9 Claims**



1. In a method for operating a gas analyzer apparatus includ-

ing the steps of venting flowing reference gas and equalizing the pressure of said flowing reference gas environment and a monitored gas environment disposed in contact with either side of a gas measuring electrochemical cell mounted in a support member defining said reference gas environment, said support member being received in a tubular shield member, an annular chamber being defined therebetween, and including a porous seal separating the annular chamber from the monitored gas environment; the improvement to said method comprising the steps of:

venting the flowing reference gas from the reference gas environment in the support tube into the annular chamber at a venting location sufficiently close to the electrochemical cell to make the gas pressure of the reference gas environment substantially equal to the gas pressure of the monitored gas environment, said venting location being selected to prevent the vented reference gas from affecting the measurement of the monitored gas environment by said electrochemical cell;

adjusting the flowing reference gas flow rate to provide a difference in gas pressure between the reference gas environment and the monitored gas environment which difference corresponds to a pressure drop established by said venting location; and

purging both said annular chamber and said porous seal of gas from the monitored gas environment with said vented flowing reference gas.

2. In an in-situ gas analyzer apparatus having reference gas vent means to vent a flowing reference gas from a reference gas environment to a monitored gas environment, the improvement wherein said gas analyzer apparatus comprises:

an electrochemical cell for generating an electrical signal in either a voltage mode or a current mode indicative of a gas constituent of interest of a monitored gas environment on the basis of a difference in the partial pressure of the gas constituent of the monitored gas environment contacting one surface of the electrochemical cell and that of the flowing reference gas environment contacting the opposite surface of the electrochemical cell;

a tubular support means;

a packing gland means securing said electrochemical cell within said tubular support means, said gland means being substantially resistant to gas flow therethrough, while resiliently accommodating mechanical stress between said cell and said tubular support means, said gland means separating said reference gas environment within said tubular support means from said monitored gas environment at said cell;

a housing portion having securing means therein for retaining the tubular support means within said housing portion; said housing portion having an aperture therein defining the reference gas vent means, said aperture being in communication with said tubular support means at a location sufficiently close to the cell to make the gas pressure of the reference gas environment substantially equal to the gas pressure of the monitored gas environment; and

means for maintaining a reference gas flow rate such that gas pressure difference between the reference gas environment and monitored gas environment across said cell is substantially equal to the pressure drop across said reference gas vent means.

4,462,873

METHOD OF FIXEDLY ARRANGING AN ARRAY OF ELECTROFORMED LETTERS OR THE LIKE ON AN ARTICLE

Eiji Watanabe, 65-26, Ibukino, Midori-ku, Yokohama, Japan

Filed Jul. 12, 1983, Ser. No. 513,150

Claims priority, application Japan, Jul. 16, 1982, 57-124259; Jan. 31, 1983, 58-014399

Int. Cl.³ C25D *1/20*

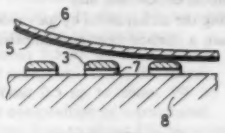
U.S. Cl. 204—4 **8 Claims**

1. A method of electroforming a plurality of letters, or letter-shaped patterns and fixedly arranging them in line in a spaced relation on a selected product, essentially comprising the steps of;

applying a layer of resist onto a metallic plate by photographic printing,

carrying out electroforming with the metallic plate immersed in an electrolyte bath,

removing the electroformed letters or letter-shaped patterns from the metallic plate with the aid of an adhesive tape having a weak adhering power,



coating each of the exposed surfaces of the electro formed letters or patterns with an adhesive agent having an adhering power higher than that of the adhesive tape,

placing the assembly of electroformed letters or patterns and adhesive tape on a selected product with some depressing force exerted thereon, and

peeling off the adhesive tape from the electroformed letters or patterns.

4,462,874

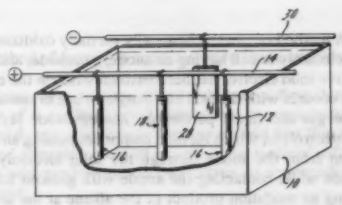
CYANIDE-FREE COPPER PLATING PROCESS

Lillie C. Tomaszewski, Dearborn, and Robert A. Tremmel, Woodhaven, both of Mich., assignors to OMI International Corporation, Warren, Mich.

Filed Nov. 16, 1983, Ser. No. 551,135

Int. Cl.³ C25D *3/38*

U.S. Cl. 204—52 R **17 Claims**



1. A process for electrodepositing a grain refined ductile and adherent copper plate on a conductive substrate which comprises the steps of providing an aqueous cyanide-free electrolyte containing copper ions present in an amount sufficient to electrodeposit copper, a complexing agent present in an amount sufficient to chelate the copper ions present, a bath soluble and compatible buffering agent present in an amount sufficient to stabilize the pH of the electrolyte, and hydroxyl and/or hydrogen ions present in an amount to provide a pH of about 6 to about 10.5; immersing a conductive substrate to be plated as a cathode in said electrolyte, immersing a combination of a copper-base soluble anode and a nickel-iron alloy insoluble anode containing about 10 percent to about 40 percent by weight iron in said electrolyte to provide a copper anode to nickel-iron alloy anode surface area ratio of about 1:2 to about 4:1, and passing current between said anodes and said cathode for a period of time sufficient to deposit copper on said substrate to the desired thickness.

4,462,875

PREPARATION OF NICKEL-OXIDE HYDROXIDE ELECTRODE

Kenneth J. Stutts, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 12, 1983, Ser. No. 560,683
Int. Cl.³ C25D 9/04
U.S. Cl. 204—56 R 9 Claims

1. A process for preparing a nickel-oxide hydroxide electrode comprising

(1) contacting a nickel metal with a basic electrolyte under electrochemical conditions, and

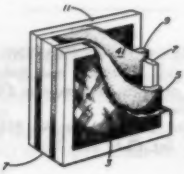
(2) electrolyzing the nickel metal by galvanostatic cycling so as to prepare a surface coating comprising nickel-oxide hydroxide.

4,462,876

ELECTRO ORGANIC METHOD AND APPARATUS FOR CARRYING OUT SAME

Norman R. DeLue, and Malcolm Korach, both of Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1983, Ser. No. 478,932
Int. Cl.³ C25C 1/00
U.S. Cl. 204—59 R 5 Claims



1. A method of electrochemically partially oxidizing alkanes in an electrolytic cell having an anode, a cathode, and an anion selective solid electrolyte therebetween wherein the electrodes are in contact with the said electrolyte or are in contact with a porous gas and liquid permeable, non-electrode layer on the solid electrolyte, which method comprises passing an electrical current from the anode through the solid electrolyte to the cathode while contacting the anode with gaseous alkane, and forming an oxidation product of the alkane at the anode.

4,462,877

COMPOSITE ION EXCHANGE MEMBRANES

Bobby R. Ezzell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 158,423, Jun. 11, 1980, Pat. No. 4,337,137.
This application Mar. 26, 1982, Ser. No. 362,227
Int. Cl.³ C25B 13/08, 13/05
U.S. Cl. 204—98 13 Claims

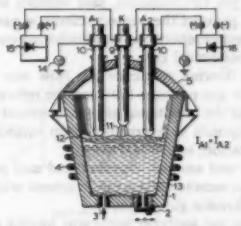
1. A process which comprises electrolyzing an aqueous electrolyte between a pair of electrodes separated by a substantially completely fluorinated composite ion exchange membrane having two layers differing in equivalent weight by less than 150.

4,462,878

METHOD OF TREATING AND REFINING LIQUID METAL ALLOYS BY DIRECT CURRENT ELECTRIC ARC HEATING

Peter H. Savov; Nikolay G. Bakalov; Alexander Y. Valchev; Boris Y. Drakaliiski; Vassil G. Peev; Stefan T. Bagarov; Yordan I. Krestenyakov; Russi T. Milenkov, all of Sofia; Malin R. Stoilov; Assen B. Ivanov, both of Pernik, and Kolyo G. Karakolev, Sofia, all of Bulgaria, assignors to Iso "METALURGKOMPLEKT", Sofia, Bulgaria

Filed Nov. 30, 1982, Ser. No. 445,433
Claims priority, application Bulgaria, Dec. 1, 1981, 54342
Int. Cl.³ C25C 3/24
U.S. Cl. 204—140 6 Claims



1. Method of treating and refining liquid metal alloys, comprising disposing such molten metal in a ladle, covering the molten metal in the ladle with a layer of liquid alloy refining slag-electrolyte, and heating the molten metal and liquid electrolyte by positioning a first consumable vertically movable electrode generally centrally of the ladle, positioning at least two second consumable vertically movable electrodes spaced at substantially equal distances on opposite sides of the first electrode in a plane located generally diametrically of the ladle, the lower end or end of one of the first and second electrodes being immersed in the liquid electrolyte and the lower end or ends of the first and second electrodes being spaced above the upper surface of liquid electrolyte, and energizing the electrodes by direct current to heat the liquid metal and the slag-electrolyte, the first electrode being of a first polarity and the second electrodes being of a second polarity, whereby to create an arc between the liquid electrolyte and the lower end of the electrode or electrodes spaced above the upper surface of the liquid electrolyte.

4,462,879

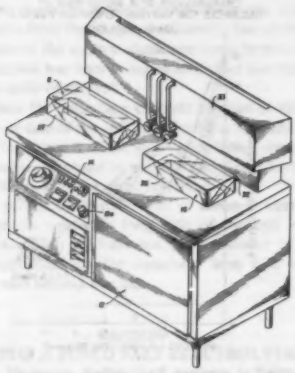
GOLD RECOVERY PROCESS

Juan D. Castellanos; Enrique C. Cardenas, both of Guadalajara, Mexico; Max B. Kelly; Lorenzo J. Kelly, and Irving Glicken, all of Miami, Fla., assignors to Mar Industries, Inc., Miami, Fla.

Division of Ser. No. 237,755, Feb. 24, 1981, Pat. No. 4,378,285.
This application Sep. 17, 1982, Ser. No. 419,188
Int. Cl.³ C25C 1/20
U.S. Cl. 204—140 5 Claims

1. A gold recovery process comprising the steps of subjecting a gold containing metal alloy body to electrolysis in an electrolyte solution containing an emulsifying agent and thereby dissolving into said solution base metal components of

the alloy body and causing the gold in said body to precipitate in said solution, filtering, washing and drying the precipitated



gold, and heating it to a molten state followed by casting as pure gold to a desired shape.

4,462,880

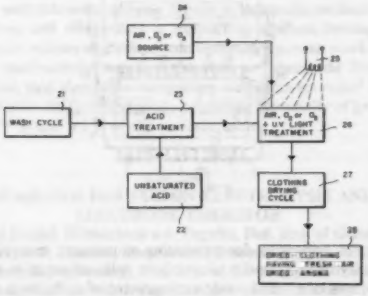
PROCESS FOR AUGMENTING OR ENHANCING THE FRESH AIR AROMA OF CONSUMABLE MATERIALS AND CLOTHING AND COMPOSITION USEFUL FOR SAME

Ira D. Hill, Locust; Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel, and Robin K. Wolff, Point Pleasant, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 384,959, Jun. 4, 1982, Pat. No. 4,434,086. This application Sep. 26, 1983, Ser. No. 535,778

Int. Cl.³ C11B *9/00*; A61K *7/46*

U.S. Cl. 204—161 **4 Claims**



1. A process for preparing a fresh air aroma comprising the steps of:

(i) saturating a natural fiber textile with water;

(ii) admixing with said water-saturated natural fiber textile at least one organic acid selected from the group consisting of oleic acid, linoleic acid and linolenic acid or glyceride ester thereof;

(iii) exposing the resulting product to a gas selected from the group consisting of air, oxygen and ozone at a pressure of from about 1 up to about 50 atmospheres and also exposing the resulting product to ultra-violet light rays; and

(iv) passing the resulting product through an operating clothes drier thereby producing a mixture of C_6-C_{15} straight chain aldehydes in said natural fiber which yields an enhanced fresh air dried aroma, said mixtur of aldehydes consisting essentially of:

(a) from about 0.5 up to about 5% by weight of said aldehyde composition of n-hexanal;

(b) from about 2 up to about 12% by weight of said aldehyde composition of n-heptanal;

(c) from about 5 up to about 15% by weight of said aldehyde composition of n-octanal;

(d) from about 40 up to about 70% by weight of said aldehyde composition of n-nonanal;

(e) from about 10 up to about 30% by weight of said aldehyde composition of n-decanal;

(f) from about 0.5 up to about 5% by weight of said aldehyde composition of n-undecanal;

(g) from about 0.5 up to about 5% by weight of said aldehyde composition of n-dodecanal;

(h) from about 0.5 up to about 5% by weight of said aldehyde composition of n-tridecanal;

(i) from about 0 up to about 5% by weight of said aldehyde composition of n-tetradecanal;

(j) from about 0 up to about 5% by weight of said aldehyde composition of n-pentadecanal.

4,462,881

METHOD OF FORMING A MULTILAYER THIN FILM

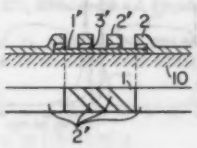
Hiroshi Yamamoto, Tokyo; Noboru Shimizu, Tokorozawa; Masahide Suenaga, Odawara; Yukihisa Tsukada, Odawara, and Tooru Takeura, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,697

Claims priority, application Japan, Nov. 27, 1980, 55-168869

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 EC **19 Claims**



1. A method of forming a multilayer thin film comprising the steps of:

(i) forming on a predetermined substrate a first thin film made of a predetermined conductive or semiconductive material, and successively forming on said first thin film a second thin film made of a conductive material different from said predetermined conductive or semiconductive material;

(ii) processing said first and second thin films to form a predetermined pattern;

(iii) cleaning a surface of said second thin film by ion etching, and successively forming on the whole surface of said substrate a third thin film made of a conductive material which is different from said predetermined conductive or semiconductive material for forming said first thin film; and

(iv) processing said second and third thin films so that said second and third thin films have a predetermined pattern different from said pattern of said first thin film.

4,462,882

SELECTIVE ETCHING OF ALUMINUM

Christopher M. Horwitz, Summer Hill, Australia, assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 3, 1983, Ser. No. 454,946

Int. Cl.³ C03C *15/00*

U.S. Cl. 204—192 E **4 Claims**

1. The process for selectively etching an aluminum-contain-

ing coating in preference to a masking material on a surface of said aluminum-containing coating which comprises coating a substrate with an aluminum-containing material, positioning a patterned masking material on said aluminum-containing coating, positioning said substrate on a target connected to a radio frequency electrode, introducing an etchant gas composition into said chamber under conditions to convert said etchant gas composition to a plasma, providing a source of oxygen and silicon to the interior of said chamber under conditions to deposit silicon dioxide selectively on said masking material layer and to etch said aluminum-containing coating not covered by said masking layer selectively.

4,462,883

LOW EMISSIVITY COATINGS ON TRANSPARENT SUBSTRATES

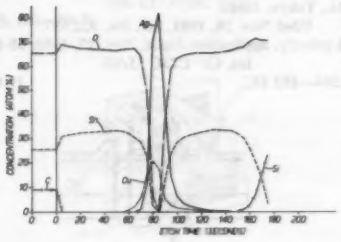
Frederick H. Hart, St. Helens, England, assignor to Pilkington Brothers P.L.C., St. Helens, England

Filed Sep. 19, 1983, Ser. No. 533,796

Claims priority, application United Kingdom, Sep. 21, 1982, 8226833; Aug. 3, 1983, 8320881

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **11 Claims**



1. A process for the production of a low emissivity coating on a transparent substrate of glass or plastics material by cathode sputtering comprising, in sequence,

(i) sputtering a layer of silver from 5 to 30 nm thick onto the transparent glass or plastics substrate

(ii) sputtering at least one additional metal other than silver in amount equivalent to a layer 0.5 to 10 nm thick onto the silver and

(iii) reactively sputtering, in the presence of oxygen or an oxidising gas, at least one anti-reflection metal oxide layer over the silver and additional metal.

4,462,884

LOW REFLECTANCE, LOW EMISSIVITY SPUTTERED FILM

F. Howard Gillery, Allison Park, and Russell C. Criss, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 25, 1983, Ser. No. 516,816

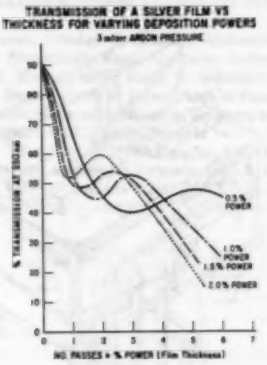
Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **8 Claims**

1. A method for producing a low reflectance transparent colored film on a transparent substrate comprising the steps of:

a. sputtering silver onto a surface of the substrate at a rate sufficient to permit agglomeration of the silver particles to form a discontinuous film;

b. discontinuing the sputtering of silver before said agglomerated silver particles form a continuous film;



c. sputtering copper onto the discontinuous agglomerated silver to form a transparent two-layer silver/copper film having a low reflectance colored appearance.

4,462,885

CONDUCTOR ARRANGEMENT OF ELECTROLYTIC CELLS FOR PRODUCING ALUMINUM

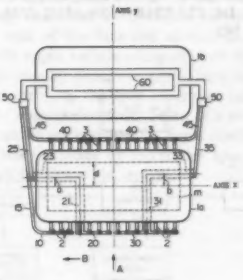
Shozo Kato, and Yasuhiko Ujimoto, both of Nagoya, Japan, assignors to Sumitomo Aluminium Smelting Company, Limited, Osaka, Japan

Filed Feb. 14, 1983, Ser. No. 465,923

Claims priority, application Japan, Feb. 19, 1982, 57-26690

Int. Cl.³ C25C *3/16*

U.S. Cl. 204—243 M **4 Claims**



1. An apparatus for producing aluminum, comprising a plurality of rectangular, electrolytic cells, disposed in at least two rows of a side-by-side arrangement of cells, each of said cells comprising:

two long sides which are upstream and downstream with respect to current flow along the row in which said cell is located;

two short ends which are substantially parallel to the current flow along the row;

first cathode bus bars for collecting cathode current at the upstream long side of the cell, extending along the outside of the short end of the cell facing the other row;

second cathode bus bars for collecting cathode current at the upstream long side of the cell, disposed in a space below said cell and substantially parallel to the longitudinal direction of the row in which the cell is located, said second bus bars being turned to the left and right in the space below each cell at a position on the downstream side

of the longitudinal center line of the cell, at a distance from said center line of 0.3 d to 0.7 d for the turn in the direction toward the other row and 0.4 d to 0.7 d for the turn in the direction opposite to the other row where d is the distance from the longitudinal center line of the cell to a long side of the molten aluminum zone in said cell, the turned second bus bars being extended to the outsides of the short ends of the cell;

third bus bars for collecting cathode current at the downstream long side of the cell, said third bus bars and said bus bars on the outsides of the short ends being connected to rising bus bars disposed on the short ends of a downstream electrolytic cell in the same row; and

means for providing that 0–40% of cathode current collected on the upstream long side of the cell is passed through said first bus bars and the remainder of cathode current collected on the upstream long side is passed through said second bus bars.

4,462,886

CATHODE FOR A FUSED SALT ELECTROLYTIC CELL

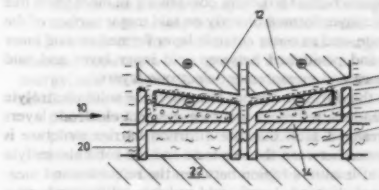
Tibor Kugler, Thayngen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Oct. 18, 1982, Ser. No. 435,046

Claims priority, application Switzerland, Oct. 23, 1981, 6788/81

Int. Cl.³ C25C *3/08*

U.S. Cl. 204—284 **16 Claims**



1. A wettable solid cathode for use in an aluminum fused salt reduction cell comprising a supporting element having an open-pore porous work-face, said open-pore porous work-face being continuously impregnated with an aluminide from a reservoir, said aluminide comprising aluminum saturated with a metal selected from the group consisting essentially of groups IV B, V B and VI B of the periodic table.

4,462,887

APPARATUS FOR FUSION ELECTROLYSIS AND ELECTRODE THEREFOR

Konrad Koziol, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany; Malcolm F. Pilbrow, Claremorris, Ireland; Christine Zöllner, Schwaig b. Nuremberg, Fed. Rep. of Germany, and Dieter H. Zöllner, Claremorris, Ireland, assignors to C. Conradty Nurnberg GmbH & Co. KG, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany

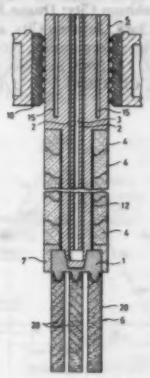
Filed Jul. 21, 1981, Ser. No. 285,560

Claims priority, application European Pat. Off., Oct. 27, 1980, 80106580.6

Int. Cl.³ C25B *11/00*

U.S. Cl. 204—286 **19 Claims**

1. Apparatus for fusion electrolysis, particularly for the elctrolytic production of aluminum, magnesium, alkaline metals and of compounds thereof, having an electrode said electrode comprising: an electrical current conducting metallic top portion and at least one replaceable bottom portion of active material, a threadable interconnection means between said portions; the top portion including a cooling means having a header and return duct; said top portion further including at least one insulating support; and a plurality of ring-like insulative moulding sections slideably and detachably surrounding at



least a portion of the top portion and supported by the insulating support.

4,462,888

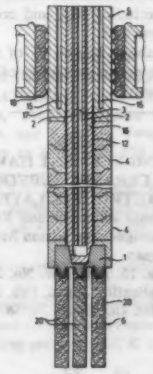
ELECTRODE FOR FUSION ELECTROLYSIS AND ELECTRODE THEREFOR

Konrad Koziol, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany; Malcolm F. Pilbrow, Claremorris, Ireland; Christine Zöllner, Schwaig b. Nürnberg, Fed. Rep. of Germany, and Dieter H. Zöllner, Claremorris, Ireland, assignors to C. Conradty Nurnberg GmbH & Co. KG, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,561

Int. Cl.³ C25B *11/00*; C25C *7/02*; C25D *17/10*

U.S. Cl. 204—286 **34 Claims**



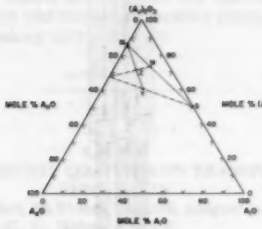
1. Apparatus for for fusion electrolysis, particularly for the electrolytic production of metals such as aluminum, magnesium, sodium, lithium or compounds thereof comprising a metallic top portion having an inner part with an upper and lower region and an outer part which outer part detachably receives at least the upper region of said inner part, a bottom portion of replaceable active material connected to said top portion by screwmounting means, and an insulating coating of high temperature stability, wherein said inner part extends substantially as far as said screwmounting means and wherein said insulating coating is a detachably mounted moulding protecting at least the lower region of said inner part.

4,462,889

NON-CONSUMABLE ELECTRODE FOR MOLTEN SALT ELECTROLYSIS

Thomas E. Landon, Johnson City; Duane R. Secrist, Elizabethton, and James M. Clark, Johnson City, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,885
Int. Cl.³ C25C 7/00, 3/00
U.S. Cl. 204—292 **4 Claims**



1. A cermet electrode composition comprising:

(a) at least about 75 vol. % of a hexagonal ferrite component ceramic composition wherein the mole % proportion of components A_fO, $(A_j)_2O_3$ and $A_\ell O$ of said ceramic composition lie within the area defined as a-b-c-d of the composition diagram of FIG. 2 of the drawings, where:

A_f is selected from the group consisting of a divalent ion from the first transition series, Sn, Zr, Nb, Ta, Hf, Mg, Li, an ion pair with one of the pair having a valence of 1+ and the other member of the pair having a valence of 3+, and combinations thereof;

A_j is selected from the group consisting of an Fe ion or a mixture of said Fe ion and one or more ions of Al, Co, Y or Mn;

A_ℓ is a divalent ion selected from the group consisting of a member of the Lanthanide series, La, Pb, the alkaline earth group excluding Mg, and combinations thereof; and O is oxygen; and

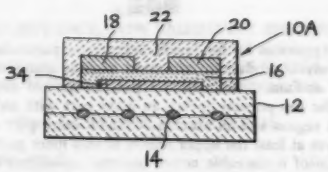
(b) no more than about 25 vol. % of a metal component selected from the group consisting of Ni, Fe, Cu, Co, Cr and mixtures thereof.

4,462,890

OXYGEN SENSING ELEMENT HAVING BARRIER LAYER BETWEEN CERAMIC SUBSTRATE AND SOLID ELECTROLYTE LAYER

Masayuki Touda; Yoshio Akimune, and Kazuo Matoba, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 16, 1982, Ser. No. 348,835
Claims priority, application Japan, Feb. 20, 1981, 56-22962
Int. Cl.³ G01N 27/58
U.S. Cl. 204—425 **6 Claims**



1. An oxygen sensing element comprising:

a substrate made of a first ceramic material;

a ceramic diffusion barrier layer made of a second ceramic material and formed on a major surface of the substrate;

a microscopically porous layer comprising an oxygen ion conductive solid electrolyte containing a stabilizing oxide formed on the barrier layer; and

microscopically porous reference and measurement electrode layers which are formed on one side of the solid electrolyte layer so as to be spaced from each other,

wherein the diffusion barrier layer, the solid electrolyte layer and the reference and measurement electrode layers are arranged such that the diffusion barrier layer is positioned between the substrate and the solid electrolyte layer, at least in a region between the reference and measurement electrode layers, the diffusion barrier layer comprising an inorganic heat-resistant material operable to limit diffusion of said stabilizing oxide contained in the solid electrolyte to a greater extent than said first ceramic material.

4. An oxygen sensing element comprising:

a substrate made of a ceramic material;

a two-layer diffusion barrier structure formed on a major surface of the substrate;

a microscopically porous layer comprising an oxygen ion conductive solid electrolyte containing a stabilizing oxide formed on the barrier layer;

microscopically porous reference and measurement electrode layers formed on one side of the solid electrolyte layer so as to be spaced from each other and in contact with an outer layer of said barrier structure;

said diffusion barrier structure comprising an inner sheet like metallic layer formed directly on said major surface of the substrate, and an outer ceramic layer formed on said inner layer and positioned between said inner layer and said reference and measurement electrode layers;

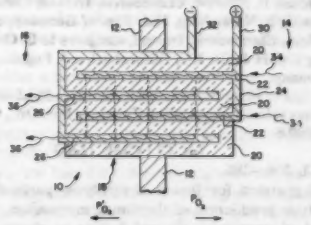
wherein the diffusion barrier structure, the solid electrolyte layer and the reference and measurement electrode layers are arranged such that the diffusion barrier structure is positioned between the substrate and the solid electrolyte layer, at least in a region between the reference and measurement electrode layers, said two layer diffusion barrier structure comprising inorganic, heat-resistant materials operable to limit diffusion of said stabilizing oxide contained in the solid electrolyte to a greater extent than said first ceramic material.

4,462,891

OXYGEN SENSOR AND HIGH TEMPERATURE FUEL CELLS

William N. Lawless, c/o CeramPhysics, Inc., P.O. Box 346, Westerville, Ohio 43081

Filed Feb. 7, 1983, Ser. No. 464,248
Int. Cl.³ G01N 27/58
U.S. Cl. 204—427 **18 Claims**



4. An oxygen sensor, comprising:

at least two layers of a porous metallic conductor;

at least one layer of an electrolytic ceramic material $Ni_2(Nb_{1-x}M_x)_2O_{7-x}$ wherein M is selected from the

group consisting of Zr^{+4}, Ti^{+4}, Sn^{+4}, Sm^{+4}, Hf^{+4}, Ce^{+4} and mixtures thereof, and wherein x is from 0 to 0.2;

said layer of ceramic material being disposed between said layers of said porous metallic conductor and cooperating therewith to form at least a portion of a body for said sensor;

a first electrode connected to a first of said layers of said porous metallic conductor; and

a second electrode connected to a second of said layers of said porous metallic conductor.

5. A sensor for determining the oxygen partial pressure of a first gas relative to the oxygen partial pressure of a second gas, said first and second gases being maintained in separate relationship, the sensor comprising:

a plurality of layers of an electrolytic ceramic material;

a plurality of layers of a porous metallic conductor;

each of said layers of porous metallic conductor being interposed between and contained by two of said layers of ceramic material so as to form a solid body of alternating ceramic and metallic layers, said body having first and second opposing sides;

first alternate ones of said layers of porous metallic conductor being exposed along said first side of said body;

second alternate ones of said layers of porous metallic conductor being exposed along said second side of said body;

a first electrode connecting said first alternate metallic layers; and

a second electrode connecting said second alternate metallic layers;

said body being adapted to be disposed such that said first side of said body is exposed to said first gas, and said second side of said body is exposed to said second gas.

12. A fuel cell for converting chemical energy released by reaction between a first gas and a second gas into electrical energy, said first and second gases being maintained in separate relationship, comprising:

a plurality of layers of an electrolytic ceramic material;

a plurality of layers of porous metallic conductor;

each of said layers of porous metallic conductor being interposed between and contained by two of said layers of ceramic material so as to form a solid body of alternating ceramic and metallic layers, said body having first and second opposing sides;

first alternate ones of said layers of porous metallic conductor being exposed along said first side of said body;

second alternate ones of said layers of porous metallic conductor being exposed along said second side of said body;

a first electrode connecting said first alternate metallic layers; and

a second electrode connecting said second alternate metallic layers;

said body being adapted to be disposed such that said first side of said body is exposed to said first gas, and said second side of said body is exposed to said second gas.

4,462,892

CONTROL OF PROCESS AID USED IN HOT WATER PROCESS FOR EXTRACTION OF BITUMEN FROM TAR SAND

Laurier L. Schramm, and Russell G. Smith, both of Edmonton, Canada, assignors to Petro-Canada Exploration Inc., Calgary; Her Majesty the Queen in right of Canada, as represented by the Minister of Energy and Natural Resources (Alberta Oil Sands Equity), Edmonton; PanCanadian Petroleum Limited, Calgary; Esso Resources Canada Limited, Calgary; Canada-Cities Service, Ltd., Calgary; Gulf Canada Limited, Calgary; Alberta Energy Company Ltd., Calgary; Hudson's Bay Oil and Gas Company Limited, Calgary and Petrofina Canada Inc., Calgary, all of, Canada

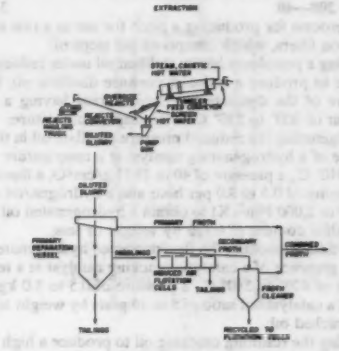
Filed Mar. 17, 1983, Ser. No. 476,025

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE **2 Claims**

1. In the process of extracting bitumen from tar sand of varying nature using the hot water process in an extraction circuit, wherein the tar sand is slurried in a conditioning drum with hot water and alkaline process aid, agitated, and then retained in a quiescent condition to produce primary bitumen froth, the improvement comprising:

determining, for a single tar sand type and the extraction circuit used, the optimum free surfactant content in the aqueous phase of the slurry, which will yield the maximum primary bitumen froth recovery;



monitoring the free surfactant content in the aqueous phase of the slurry during subsequent processing of various types of tar sand feed in said circuit;

and varying the process aid addition to the slurry as the nature of the tar sand feed varies, as required to maintain said free surfactant content substantially at the optimum free surfactant content previously established for the circuit.

4,462,893

PROCESS FOR PRODUCING PITCH FOR USING AS RAW MATERIAL FOR CARBON FIBERS

Kunihiko Moriya, Tokyo; Kazuhito Tate, Kanagawa; Goro Muroga, Tokyo, and Kazuhiro Yanagida, Kanagawa, all of Japan, assignors to Mitsubishi Oil Company, Ltd., Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 422,913

Claims priority, application Japan, Sep. 24, 1981, 56/149501

Int. Cl.³ C10C *3/06, 3/08*

U.S. Cl. 208—40 **1 Claim**

1. A process for producing a pitch, which comprises the steps of:

distilling a petroleum heavy residual oil under reduced pressure to produce a reduced pressure distillation residual oil having a boiling point of 500° C. or more at atmospheric pressure;

deasphaltening the reduced pressure distillation residual oil using a solvent comprising at least one saturated hydrocarbon compound having 3 to 5 carbon atoms wherein the ratio of the solvent to oil is from 3:1 to 15:1, the temperature is between 50° C. to 150° C. and the pressure is between 5 to 50 kg/cm^2G;

extracting the solvent deasphaltened oil using a furfural solvent at a temperature of 45° to 145° C. at a pressure of 0.1 to 2.0 kg/cm^2G, the ratio of the furfural solvent to oil being from 1:1 to 4:1; and

thermally modifying the solvent extractions component extract at a temperature of 390° to 450° C. for 1 to 30 hours.

4,462,894

PROCESS FOR PRODUCING PITCH FOR USING AS RAW MATERIAL FOR CARBON FIBERS

Kunihiko Moriya, Tokyo; Kazuhito Tate, Kanagawa; Goro Muroga, Tokyo, and Kazuhiro Yanagida, Kanagawa, all of Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,216

Claims priority, application Japan, Aug. 18, 1981, 56-128141

Int. Cl.³ C10C *3/06*; C10G *45/00*

U.S. Cl. 208—40 **3 Claims**

1. A process for producing a pitch for use as a raw material for carbon fibers, which comprises the steps of:

distilling a petroleum heavy residual oil under reduced pressure to produce a reduced pressure distillate oil, 95% or more of the distillate fractions thereof having a boiling point of 300° to 550° C. at atmospheric pressure;

hydrogenating the reduced pressure distillate oil in the presence of a hydrogenating catalyst at a temperature of 300° to 410° C., a pressure of 40 to 150 kg/cm^2G, a liquid space velocity of 0.5 to 3.0 per hour and a hydrogen/oil ratio of 260 to 2,000 Nm^3/Kl to obtain a hydrogenated oil having a sulfur content of 0.4% by weight or less;

catalytically cracking the thus produced hydrogenated oil in the presence of a catalytic cracking catalyst at a temperature of 470° to 540° C., a pressure of 0.5 to 5.0 kg/cm^2G and a catalyst/oil ratio of 5 to 15 parts by weight to obtain a cracked oil;

distilling the resulting cracking oil to produce a high boiling point fraction having a boiling point of greater than 300° C.; and

thermally modifying the high boiling point fraction at a temperature of 390° to 430° C. for 1 to 30 hours to obtain a pitch.

4,462,895

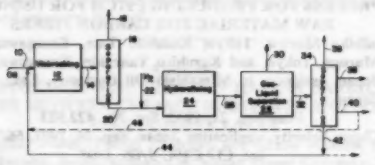
COMBINATION VISBREAKING AND HYDROREFINING WITH RECYCLE OF HYDROREFINED BOTTOMS

Omer Bicerogiu, and Bruce M. Sankey, both of Sarnia, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Feb. 25, 1983, Ser. No. 469,747

Int. Cl.³ C10G *65/12, 69/06*

U.S. Cl. 208—59 **10 Claims**



1. A process for upgrading a heavy hydrocarbonaceous oil, which comprises the steps of:

(a) treating a chargestock comprising a fresh heavy hydrocarbonaceous oil containing at least about 10 volume percent materials boiling above 1050° F. and a hydrorefined bottoms fraction recycled from step (d) in a visbreaking zone at visbreaking conditions to produce a visbroken oil product, said visbroken oil comprising materials boiling above 1050° F.;

(b) contacting at least a portion of said visbroken oil with a hydrorefining catalyst in the presence of added hydrogen in a hydrorefining zone at hydrorefining conditions such as to convert at least about 5 weight percent of the materials boiling above 1050° F. of said visbroken oil to lower boiling hydrocarbons, said hydrorefining conditions including a hydrogen partial pressure of at least 1000 psig, to produce a hydrorefined effluent comprising a normally gaseous phase and a normally liquid phase, including normally liquid hydrocarbons;

(c) separating the hydrorefined oil product resulting from step (b) into fractions, including a hydrorefined heavy bottoms fraction, and

(d) recycling at least a portion of the separated hydrorefined heavy bottoms fraction comprising materials boiling above 1050° F. to said visbreaking zone, at a volumetric ratio of recycled bottoms fraction to said fresh oil ranging from about 0.1:1 to 5:1.

4,462,896

METHOD OF REMOVING ARSENIC IN HYDROCARBONS

Hiroshi Kitagawa; Teruyuki Onodera, both of Takaishi; Toshiyuki Fukushima, Izumi, and Yoriyuki Hayashi, Shimonoseki, all of Japan, assignors to Osaka Petrochemical Industries Ltd. and Toyo CCI Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,707

Int. Cl.³ C10G *29/02, 29/04*

U.S. Cl. 208—253 **5 Claims**

1. A method of removing arsenic in gaseous hydrocarbons, particularly LPG, comprising reacting arsenic compounds in the gaseous hydrocarbon in a gas phase reaction at a temperature of 0°–80° C. under a reaction pressure of 0–30 kg/cm^2 with a metal oxide and retaining the resultant reaction product on said metal oxide, whereby the arsenic compound in the gaseous hydrocarbon is substantially removed therefrom.

4,462,897

HYDROTREATMENT PROCESS

Jeffrey T. Miller, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 231,757, Feb. 5, 1981, abandoned. This application Feb. 18, 1983, Ser. No. 467,952

Int. Cl.³ C10G *45/08, 45/60*

U.S. Cl. 208—254 H **4 Claims**

1. A process for hydrotreatment of a hydrocarbon feed wherein the hydrocarbon feed comprises a whole shale oil or a shale oil fraction and contains at least about 0.1 wt.% nitrogen, comprising contacting the hydrocarbon feed with hydrogen under hydrotreatment conditions in the presence of a catalyst comprising a phosphorus component, a chromium component, a molybdenum component and a cobalt component, deposed on a support comprising at least one porous refractory inorganic oxide.

4,462,898

ORE FLOTATION WITH COMBINED COLLECTORS

Robert M. Parlman, and Clarence R. Bresson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1982, Ser. No. 409,254

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **1 Claim**

1. An ore flotation process comprising

(a) mixing a mineral material comprising molybdenum containing ore, water and a composition containing the following compounds

(aa) sodium diethyl dithiophosphate

(bb) sodium ethyl trithiocarbonate in a weight ratio of compound (aa) to compound (bb) in the range of 9:1 to 1.9 to establish a pump,

(b) aerating said pulp to produce a froth and a tail product,

(c) separating said froth and said tail product, and

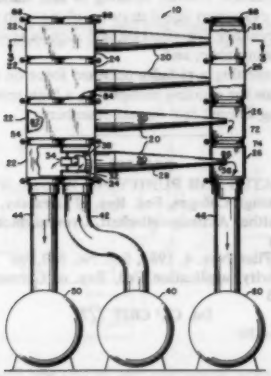
(d) recovering molybdenum containing mineral values from said froth.

4,462,899

HYDROCYCLONE CLEANER ASSEMBLY

Robert O. Wambsgans, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Dec. 20, 1982, Ser. No. 451,116
Int. Cl.³ B04C 5/28
U.S. Cl. 209—211 2 Claims



1. A centrifugal cleaner for separating solids from a fluid suspension comprising:

a. a first fluid plenum chamber;

b. a second fluid plenum chamber disposed adajcent said first fluid plenum chamber;

c. a third fluid plenum chamber disposed in alignment with and spaced from said first and second fluid plenum chambers; and

d. an axially elongated tubular shell defining a centrifugal separating chamber having means defining an inlet and means defining an axially directed accepts outlet at one end of the separating chamber and means defining an axially directed rejects outlet at the axially opposite end of the separating chamber, the inlet means opening directly into said second fluid plenum chamber and the accepts outlet means opening directly into said first fluid plenum chamber and the rejects outlet means opening directly into said third fluid chamber, each of said first, second and third plenum chambers having a first fluid flow opening in a first wall thereof and a second fluid flow opening in a second wall thereof opposite the first wall thereby providing flow passages through which said fluid suspension may enter and leave said plenum chambers, each of said first and second fluid flow openings comprising flanged openings, the flange of the first fluid flow opening being an annular flange adapted to be slidably matable with a cylindrical flange of the second fluid flow opening when nested with another of said centrifugal cleaners.

4,462,900

CENTRIFUGAL PULP SCREENING DEVICE AND METHOD

John B. Matthew, Pittsfield, Mass., assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 16, 1982, Ser. No. 399,111
Int. Cl.³ B07B 1/22
U.S. Cl. 209—243 13 Claims

1. A centrifugal pulp screening device comprising in combination:

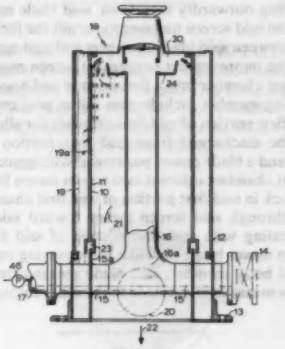
a vertically oriented perforate wall cylindrical screen having screen openings therein;

an outer enclosing housing for containing fiber accepts passing through the screen openings from stock within the screen;

a concentric centrally located stock supply conduit having an annular discharge at the upper end of the screen with a lower slice lip;

an upper annular slice lip defining a radially facing slice opening with the lower lip for the discharge of stock to the interior of the screen;

means directing the flow of stock in a spiral direction within the screen;



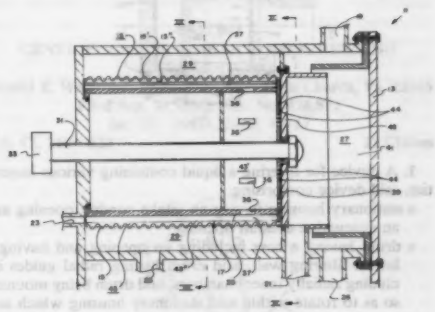
means at the lower end of the housing for withdrawing reject material not passing through the screen openings; and adjustable means for adjustably moving said upper lip for controlling the size of the slice opening and the centrifugal movement of stock through the center of the screen.

4,462,901

APPARATUS FOR SCREENING FIBROUS STOCK

W. Thomas Gauld, 4313 Winding Way, Mobile, Ala. 36609

Filed Dec. 28, 1981, Ser. No. 335,246
Int. Cl.³ B07B 9/00, 1/20
U.S. Cl. 209—234 8 Claims



1. An improved apparatus for screening fibrous stock of the type including a hollow housing member having an inlet port for allowing fibrous stock to be introduced into the interior thereof and having an outlet port for allowing screen fibrous stock to be discharged therefrom; a cylindrical, open-ended screen member positioned within said housing member; said housing member including structure means for fixedly mounting said screen member within said housing member and for isolating the outer side of said screen member to divide the interior of said housing member into a first chamber and a second chamber with the boundary between said first and second chambers defined in part by said screen member, said inlet port communicating directly with said first chamber and said outlet port communicating directly with said second

chamber; a rotatable shaft member located substantially along the longitudinal axis of said screen member; a rotor means for causing fibrous stock within said first chamber to pass through said screen member into said second chamber and out said outlet port, said rotor means including a cylindrical body member fixedly attached to said shaft member for rotation therewith and including a plurality of blade members attached to and spaced about the circumference of said body member and radiating outwardly therefrom, said blade members being spaced from said screen member to permit the forming of a mat of stock between said blade members and said screen member; wherein the improvement comprises: screen means for dividing said first chamber into a first portion and a second portion, said housing member including an outlet port communicating with said first portion of said first chamber for allowing fibrous stock to be discharged from said first portion of said first chamber; and a blade means positioned within said first portion of said first chamber adjacent said screen means for wiping any fibrous stock in said first portion of said first chamber that will not pass through said screen means toward said outlet port communicating with said first portion of said first chamber; said screen means being platelike and covering one end of said cylindrical body member, said blade means extending across said screen means from one side to the other through the center thereof.

4,462,902

MEANS FOR FILTERING A LIQUID CONTAINING VARIOUS IMPURITIES

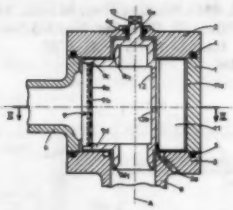
Jean-Max M. Silhouette, Melun, France, assignor to S.N.E.C.-M.A., Paris, France

Filed Oct. 28, 1982, Ser. No. 437,291

Claims priority, application France, Oct. 28, 1981, 81 20547

Int. Cl.³ B01D *23/24*

U.S. Cl. 210—107 **6 Claims**



1. A device for filtering a liquid containing various impurities, said device comprising:

a stationary housing having an intake conduit opening and an evacuation conduit opening;

a drum having a base including an opening and having a lateral filtering wall, said drum having radial guides including radially inner chambers, said drum being mounted so as to rotate within said stationary housing which surrounds said drum, said drum and housing providing an essentially annular chamber around a lateral wall of said drum;

radial blades slide mounted within said guides and extending from said lateral wall of said rotating drum so that inner edges of said blades face said chambers and outer edges of said radial blades are tightly sealed against an inner wall of said stationary housing in such a way as to define on said lateral wall of said drum at least one active filtering zone through which the liquid to be filtered enters said drum, and at least one cleaning zone traversed by a minor fraction of the already filtered liquid while the majority of said liquid is evacuated from said drum through said opening in said drum base;

means provided to rotate said drum so that various sections of said lateral wall divided by said radial blades serve alternately and periodically as a filtering zone and as a cleaning zone,

wherein sections of said rotating drum associated with said filtering and cleaning zones of said lateral wall communicate freely with each other, whereby a minor fraction of the filtered liquid leaves said drum directly through said cleaning zone of said lateral wall and is evacuated through said evacuation conduit opening in said stationary housing, said evacuated liquid drawing along with it the impurities previously deposited on said section associated with said cleaning zone; and

means for exerting a radially outward force on said blades, said means for exerting comprising a high pressure pump delivering filtered fuel to said chambers.

4,462,903

APPARATUS FOR PURIFYING WASTE WATER

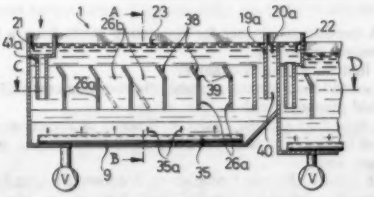
Dietmar Wettengl, Cologne, Fed. Rep. of Germany, assignor to Buckau-Walther Aktiengesellschaft, Grevenbroich, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,186

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244963

Int. Cl.³ C02F *1/72*

U.S. Cl. 210—150 **17 Claims**



1. Apparatus for purifying waste water by oxidizing the water with oxygen or oxygen containing gas in the presence of particles of a solid catalyst in a reaction vessel having a plurality of sides and a bottom which defines an internal cavity which includes a plurality of compartments, said reaction vessel including inlet means for introducing waste water into said compartments in sufficient amounts to reach a high water level, outlet means for discharging purified water from the compartments after purification and ventilating means for introducing said gas into said compartments from the bottom of the vessel, wherein each of the chambers includes a pair of risers interconnected by a plurality of partitions to form a plurality of sub-chambers, said risers and said partitions being proximately spaced from the bottom of the vessel and above said ventilating means and extending to a point below the high water level of the vessel and wherein said inlet means include separate inlet devices for each of said compartments and said outlet means include separate outlet devices for each of said compartments.

4,462,904

PULSED REGENERATION OF ADSORPTION COLUMN

Donald G. Hager, Tucson, Ariz.; Michael L. Massey, Covington, Va., and Frederick Rubel, Jr., Tucson, Ariz., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 357,566, Mar. 12, 1982, Pat. No. 4,416,798. This application Aug. 8, 1983, Ser. No. 502,565

Int. Cl.³ B01J *19/04*

U.S. Cl. 210—177 **2 Claims**

1. An apparatus for adsorptively removing select compounds from a fluid flow stream comprising:

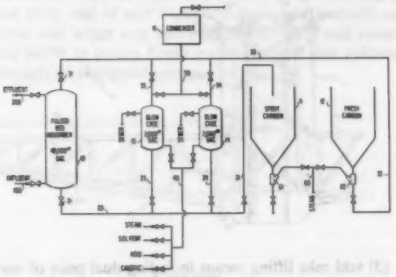
A. a vertical pressure contacting vessel charged with a column of particulate, activated carbon;

B. a valved influent conduit at one end of said contacting vessel and a valved effluent conduit at the other end;

C. first manifold means connecting said contacting vessel one end to both of at least two, high temperature capacity, steam regeneration vessels, said steam regeneration vessels respectively having a fractional volume capacity less than said activated carbon column;

D. second manifold means connecting said contacting vessel other end with both of said two steam regeneration vessels;

E. first means including said first manifold means to remove a first fractional portion of said activated carbon column



from said one end of said contacting vessel and deposit said first fractional portion in a first one of said regeneration vessels;

F. second means including said second manifold means to remove a regenerated portion of carbon substantially equal to said first portion from the second one of said regeneration vessels and deposit said second portion at the other end of said contacting vessel, and;

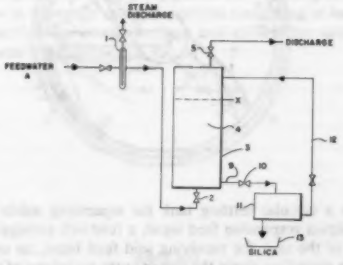
G. steam supply means connected to said first and second regeneration vessels for regeneration of said first portion of activated carbon simultaneous with the continuance of said fluid flow stream through said influent and effluent conduits and through said column of activated carbon.

4,462,905

DESILICATION OF GEOTHERMAL WATER

Robert C. Axtmann, 346 Burnt Hill Rd., Skillman, N.J. 08558

Division of Ser. No. 218,844, Dec. 22, 1980, Pat. No. 4,378,295.
This application Sep. 27, 1982, Ser. No. 424,742
Int. Cl.³ B01J *8/20*
U.S. Cl. 210—189 **1 Claim**



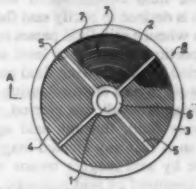
1. An apparatus for reducing the dissolved silica content of geothermal fluid to allow reinjection into its source which comprises, a particle fluidizing chamber, particles in said chamber, conduit means for conveying said fluid to said chamber at a sufficient rate to maintain said particles in a fluidized state and causing the coating of said particles with silica from said fluid, a conduit means located at the top of said chamber for conveying treated fluid from the particle fluidizing chamber, a conveying means located adjacent the base of said chamber for removing a portion of said coated particles from the chamber, a ball mill for removing said coating from said removed particles, conveying means for returning said particles from which the coating has been removed to the top of said chamber and means for controlling the temperature or pressure of said fluid conveyed to said chamber to prevent flashing of the fluid in the chamber.

4,462,906

FILLER FOR ELECTROMAGNETIC FILTERS

Nobukatsu Inaba, Chiba, and Satoshi Yoshida, Funabashi, both of Japan, assignors to Japan Organo Co., Ltd., Japan

Filed Dec. 14, 1982, Ser. No. 449,829
Claims priority, application Japan, Jan. 8, 1982, 57-561[U]
Int. Cl.³ B01D *35/06*
U.S. Cl. 210—222 **6 Claims**



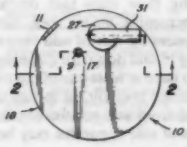
1. An assembly of fillers for electromagnetic filters comprising two or more fillers each of which is comprised of a spiral magnetic material having an aperture in its center; an outer ring surrounding said spiral magnetic material and having a thickness greather than that of said spiral magnetic material; and a woolly magnetic material mounted in the internal space of said outer ring bounded by the upper edge of said sprial magnetic material and the inside surface of said outer ring; said fillers being stacked and held together by means of a shaft extending through the central apertures of said spiral magnetic materials.

4,462,907

CENTRIFUGAL, MAGNETIC AND SCREENING SEPARATOR

Donald E. Waldecker, 113 Gordon Rd., Falls Church, Va. 22046

Filed Sep. 29, 1982, Ser. No. 426,872
Int. Cl.³ B01D *35/06, 45/12*
U.S. Cl. 210—223 **11 Claims**



1. An apparatus for separating solid contaminants including magnetic particles from a flowing fluid comprising means capable of existing in three distinct modes, namely, a normal operating mode, a clogged mode, and a down for cleaning and/or repair mode consisting of: a housing for holding fluid, said housing including a tubular housing member defining a hollow chamber in said housing, a top cover member carrying a fluid return fitting mounted on the normally upper end of said tubular housing member, means connected to the normally lower end of said tubular member providing a bottom closure for said housing, and means providing for detachment of at

least one of said top cover member or said bottom closure from said tubular housing member, a tubular fluid-conveying conduit including a spirally wound portion, located in said chamber at least during said normal operating and clogged modes, said tubular fluid-conveying conduit including a tubular inlet portion carried by and extending through said top cover member and connected to one end of said spirally wound portion, said tubular conduit including a tubular discharge portion connected to and extending upwardly from the opposite end of said spirally wound portion, whereby said tubular conduit including said spirally wound portion and said tubular inlet and discharge portions are supported by said top cover member, said spirally wound portion of said tubular conduit including aperture means in a radially outer wall portion of a spiral turn thereof, magnet means supported in said hollow chamber contiguous said aperture means of said spirally wound portion of said fluid-conveying conduit, and screening means carried by and within said apparatus near the upper end thereof; said apparatus when existing in its normal operating mode being adapted to receive fluid contaminated with solids, from a system in which it is desired to purify said fluid, by way of said inlet portion from whence said fluid passes on to said aperture-including spiral portion whereby at least some of said solid contaminants carried by said flowing fluid passing through said spiral portion on a given pass of said flowing fluid through said apparatus, if sufficiently small, are ejected, along with a portion of said flowing fluid, through said aperture means by centrifugal force such that any ejected magnetic particles are subject to capture by said magnet means whereas any solid contaminants not captured by said magnetic means either drift to the bottom of said apparatus under the influence of gravity or pass with said fluid portion toward said screening means whereat those solid contaminants too large to pass through said screening means are blocked by said screening means and said fluid portion continues through said screening means and rejoins the remainder of said flowing fluid, other than said portion of said flowing fluid on said given pass, downstream of said screening means for exit from said apparatus to said system by way of said return fitting, said flowing fluid portion after ejection through said aperture means being kept in continuous motion in said housing while progressing adjacent said magnetic means and while progressing to and through said screening means and out said return fitting by displacement of additional flowing fluid exiting said aperture means, whereby fluid suspended magnetic particles downstream of said aperture means and upstream of the screening means but adjacent said magnetic means are kept in motion thereby improving the probability of their eventual if not immediate capture by said magnetic means, said apparatus when existing in its clogged mode having one of said aperture means or screening means clogged to the extent that said system would be subject to starvation except for a continuing flow of system fluid through said spirally wound portion and said tubular discharge portion which continuing flow exits said discharge portion downstream of said screening means then exits said apparatus for return to said system by way of said return fitting, said apparatus when existing in said down for cleaning and/or repair mode being adapted to have at least one of the top cover member and said portions carried thereby, or means including the bottom closure detached from said tubular housing member whereby internal portions of said apparatus may be made accessible for cleaning and/or repair.

4,462,908

RAKE LIFTING MEANS FOR SEDIMENTATION APPARATUS

Jack H. Eichler, Westport, and Stephen A. Landsman, Fairfield, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

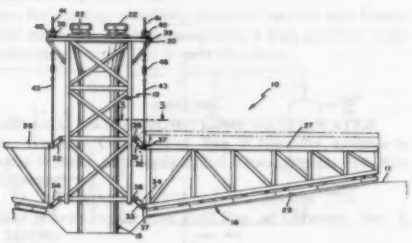
Filed Oct. 25, 1982, Ser. No. 436,305
Int. Cl.³ B01D *21/18*
U.S. Cl. 210—237 **9 Claims**

1. A sedimentation apparatus including a settling tank for separating solids from a liquid-solids suspension, a settled solids collecting zone on the tank bottom, a rotary rake mechansim effective to move the settled solids on said tank bottom to said settled solids collecting zone for discharge from said tank, said rotary rake mechanism comprising

(a) at least a pair of rake arms each having blades at the bottom thereof adapted to engage the settled solids on the tank bottom,

(b) support means mounting said rake arms for rotation about a vertical axis at the center of said settling tank,

(c) rake lifting means interconnected to said rake arms and to said rake arm support means,



(d) said rake lifting means including dual pairs of vertically spaced and parallel pivot arms for each of said rake arms, each pviot arm of a pair of said pivot arms being horizontally spaced one from the other, and each having a hinge connection to said rake arm and to said support means and

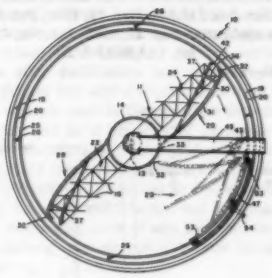
(e) actuating means to move said dual pair of pivot arms of a rake arm about said hinge connection in unison to raise or lower said rake arm in a vertical plane relative to said tank bottom.

4,462,909

SURFACE SKIMMER MEANS FOR SETTLING TANK

George W. Kennel, White Plains, N.Y., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 4, 1983, Ser. No. 482,035
Int. Cl.³ B01D *21/06*
U.S. Cl. 210—525 **10 Claims**



1. In a circular settling tank for separating solids from a solids-liquid suspension feed input, a feedwell arranged at the center of the tank for receiving said feed input, an overflow launder extending about the upper outer periphery of the tank for discharging supernatant liquid separated from solids settled at the tank bottom, a second outlet means at the bottom of the tank for said settled solids, a rotary rake structure having spaced rake arms effective to move said solids over said tank bottom to said second outlet means, a circular baffle about the inner upper periphery of said tank spaced from said launder, and skimmer means provided between said feedwell and baffle for sweeping floating materials from the surface of the superna-

tant liquid to a collector mounted at said baffle at the periphery of said tank, said skimmer means comprising:

a. an elongated wiper arm carried by at least one rake arm, and extending radially across the tank, said arm having one end engaging said baffle and the other end engaging the outer wall surface of said feedwell in operative sweeping position,

b. spring means maintaining said ends of said wiper arm in engaged operative position with said feedwell and said baffle, and

c. cam actuated means carried by said wiper arm and operable for moving said wiper arm about a pivot to disengage said other end of said wiper arm from said feedwell and move said wiper arm into engagement with said peripheral baffle to sweep floating material into said collector through an elongated opening therein.

4,462,910

OIL SLICK DISPERSANTS USING DIGUANIDINIUM SALT

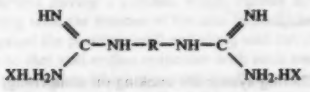
Andre Lepain, Rosieres, and Robert D. E. M. Bronchart, Brussels, both of Belgium, assignors to Coeden Technology, Inc., Dallas, Tex.

Filed Feb. 3, 1983, Ser. No. 463,372

Int. Cl.³ C02F *3/00*; B01F *17/16*

U.S. Cl. 210—610 **11 Claims**

1. A process for reducing oil slicks on seawater comprising treating oil-polluted seawater with a liquid dispersing composition and a nitrogen-containing nutrient for seawater microorganisms which are active in oil metabolization, said nutrient being a diguanidinium salt having the general formula



wherein R is an alkyl radical containing from about 2 to about 12 carbon atoms and X is a halogen or an acid anion.

6. A liquid dispersing composition for reducing crude oil pollution in seawater, said composition containing at least one surface-active compound, at least one solvent for said compound, and a diguanidinium salt.

4,462,911

DETOXIFICATION OR DECONTAMINATION OF EFFLUENTS AND/OR FLUE GASES

Friedrich Samhaber, Peuerbach, Austria, assignor to Andritz-Ruthner Industrieanlagen Aktiengesellschaft, Vienna, Austria

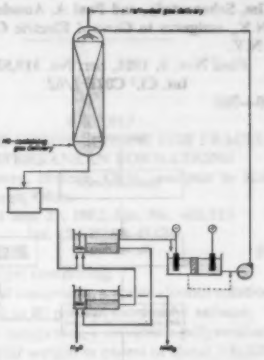
Filed Apr. 16, 1982, Ser. No. 369,082

Claims priority, application Austria, Apr. 16, 1981, 1756/81

Int. Cl.³ C02F *1/62*

U.S. Cl. 210—638 **7 Claims**

1. A process for detoxifying or decontaminating an effluent containing chromium (VI), and waste gas containing NO_x, wherein said effluent and said waste gas are reacted together,



thereby causing chromium (VI) to react with NO_x, with formation of chromium (III) and higher oxide(s) of N.

4,462,912

PROCESS FOR REMOVING MOLYBDENUM FROM AQUEOUS MANGANESE SALT SOLUTIONS

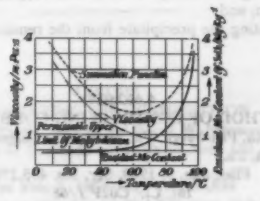
Eberhard Preisler, Erftstadt-Liblar; Bernhard Hofmann, Hürth-Knapsack, and Gerhard Nolte, Erftstadt-Lechenich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 26, 1982, Ser. No. 444,865

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150139

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—665 **8 Claims**



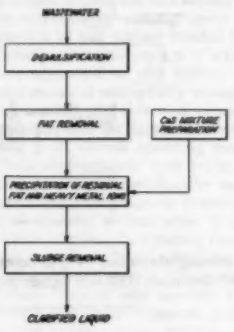
Viscosity Of A 1.5 Molar Manganous Sulfate Solution And Residual Molybdenum Content Of The Solution After Adsorption And Filtration At Various Temperatures.
pH Of The Solution: 5
150 mg MnO₂/L, 60 mg Kieselguhr/L
Content Of The Solution Before Purification: 5 mg/L Molybdenum

1. Process for removing molybdenum from aqueous manganese(II)salt solutions by adsorbing the molybdenum on manganese dioxide and separating adsorbent and adsorbate from the purified manganese(II)salt solution, which comprises: establishing a pH value lower than 5 in the manganese salt solution; adding, at temperatures between 50° and 80° C., an oxidant capable of oxidizing manganese(II)compounds to manganese(IV)compounds and thereby effecting the oxidation of a minor proportion of dissolved manganese(II)salt to manganese dioxide; allowing resulting precipitate to remain in contact over a period of at least 15 minutes with the manganese(II)salt solution, and separating the precipitate from said solution at said temperatures.

4,462,913
PROCESS FOR TREATING WASTEWATER CONTAINING FAT AND HEAVY METAL IONS

Bang M. Kim, Schenectady, and Paul A. Amodeo, Jr., Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,530
Int. Cl.³ C02F 1/62
U.S. Cl. 210—708 9 Claims



1. A process for treating wastewater containing emulsified oil and heavy metal ions so as to substantially remove both therefrom comprising the steps of:

A. forming a scum of a quantity of the oil by adding and mixing an emulsion breaker with said wastewater so as to leave only relatively small residual amounts of oil in suspension and in solution;

B. separating the scum from the rest of the wastewater;

C. adding enough of an aqueous calcium sulfide mixture to the wastewater to precipitate heavy metal ions and residual oil therefrom, said aqueous calcium sulfide mixture consisting essentially of CaS, $Ca(OH)_2$ and $Ca(HS)_2$ in solution; and

D. separating the precipitate from the remaining wastewater.

4,462,914
METHOD OF CONTROLLING CORBICULA

Alan L. Smith, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Jan. 3, 1983, Ser. No. 455,170
Int. Cl.³ C02F 1/68
U.S. Cl. 210—755 2 Claims

1. A method of controlling Corbicula in aqueous systems used for cooling or service water purposes, comprising adding to such a system a molluscicidally effective amount of poly(dimethyldiallyl ammonium chloride), wherein said poly(dimethyldiallyl ammonium chloride) has a weight average molecular weight of from about 200,000 to 400,000.

4,462,915
METHOD AND SYSTEM FOR FILTERING COOKING OIL

Bernard Friedman, Allentown, Pa., assignor to Oil Process Systems, Inc., Allentown, Pa.

Filed Sep. 23, 1981, Ser. No. 304,653
Int. Cl.³ B01D 29/20
U.S. Cl. 210—765 25 Claims

1. A method of filtering cooking oil in a cooking vessel, comprising the steps of:

providing a collection vessel, a filter member, and a centrifugal pump apparatus, said centrifugal pump apparatus including an impeller, an impeller discharge, a flexible conduit having an inlet end coupled in fluid communication with said impeller discharge and an outlet end, and a housing having a hollow interior in which said impeller is located, said housing being of a size and configuration for supporting said centrifugal pump apparatus in free-standing relationship on a base of a vessel, said housing of said centrifugal pump apparatus being at least partially defined by strainer means having openings therethrough to permit the passage of oil into said hollow interior of said housing to be in contact with said impeller;

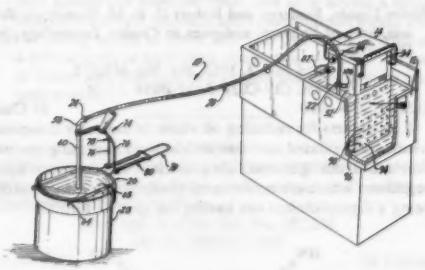
supporting said filter member in relation to said collection vessel so as to be in position to receive oil to be filtered and to discharge filtered oil into said collection vessel after it has been filtered by said filter member;

placing said centrifugal pump apparatus directly in said cooking vessel so that said housing is supported on the base of said cooking vessel and so that at least said impeller is in direct contact with said oil to be filtered in said cooking vessel;

arranging said outlet end of said flexible conduit so as to be in position to discharge oil into said filter member; and

operating said centrifugal pump apparatus to rotate said impeller to pump said oil from said cooking vessel through said flexible conduit into said filter member.

10. The method of claim 1 further including the step of treating said cooking oil with a treatment material to remove predetermined contaminants contained in said cooking oil prior to operating said centrifugal pump apparatus to pump cooking oil from said cooking vessel.



13. A filtering system for cooking oil comprising, in combination:

an oil-containing vessel containing a cooking oil to be filtered;

an oil-receiving vessel for receiving cooking oil which has been filtered;

a filter member for filtering cooking oil, said filter member including means for supporting said filter member in relation to said oil-receiving vessel to receive oil to be filtered from said oil-containing vessel and to deposit filtered cooking oil into said oil-receiving vessel;

a centrifugal pump apparatus which includes an impeller, an impeller discharge, a flexible conduit having an inlet end coupled in fluid communication with said impeller discharge and an outlet end, and a housing having a hollow interior in which said impeller is located, said housing being of a size and configuration for supporting said centrifugal pump apparatus in free-standing relationship on the base of said oil-containing vessel so that at least said impeller is in direct contact with said cooking oil to be filtered, said housing of said centrifugal pump apparatus being at least partially defined by strainer means having openings therethrough to permit the passage of oil therethrough into said hollow interior of said housing to be contact with said impeller, and said outlet end of said flexible conduit being adapted to be arranged with respect to said filter member to discharge oil into said filter member; and

means for operating said centrifugal pump apparatus to rotate said impeller to pump said cooking oil from said oil-containing vessel through said flexible conduit into said filter member.

4,462,916

MULTI-ELEMENT FILTER WITH ROTARY BACKWASH ARM

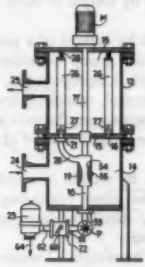
Jacques Ecabert, Montmorency, and Guy Aillet, Franconville, both of France, assignors to Societe d'Exploitation des Etablissements, Paris, France

Filed Mar. 30, 1982, Ser. No. 363,488

Claims priority, application France, Apr. 3, 1981, 81 06722

Int. Cl.³ B01D 25/38

U.S. Cl. 210—798 **6 Claims**



1. In a process for continously filtering a fluid in an apparatus comprising an enclosure divided internally into an inlet compartment and an outlet compartment by a partition wall defining at least one circular row of apertures, filtering elements of hollow tubular shape closed at one end and fixed in the outlet compartment by an open opposite end of the filtering elements on each one of said apertures of the partition wall, a rotary arm defining a hollow interior mounted in the inlet compartment and having a portion which defines an orifice communicating with the interior of the arm and which sweeps along and against the partition wall and along said circular row of apertures so that said orifice coincides with each one of the apertures in turn, and in which apparatus the fluid to be filtered is admitted under pressure into the inlet compartment, said process comprising supplying said fluid under pressure to the inlet compartment and passing said fluid through the filtering elements from the interior toward the exterior of the filtering elements, receiving filtered fluid in the outlet compartment and, for the purpose of clearing each filtering element, creating a pressure drop across each said filtering element by way of said orifice and the interior of said rotary arm as said arm is rotated relative to said partition wall and receiving through the interior of said arm a resulting current of said fluid charged with impurities which had been arrested by said filtering element; the improvement comprising in combination creating a suction in the interior of said arm by means of a suction pump, creating said pressure drop by first hermetically closing the aperture communicating with said each filtering element by means of a shoe which is carried by said orifice defining portion of said arm and is in permanent sealing contact with said partition wall and completely covers the aperture communicating with said each filtering element immediately before said arm orifice reaches each said aperture, said arm orifice is initially closed by the partition wall so that said suction created by said suction pump is at a maximum, and thereafter, as said arm continues to rotate, putting said arm orifice in full coincidence with said aperture communicating with said each filtering element, and ensuring that only one of said apertures at a time communicates with the interior of said arm, thereby producing a sudden counter-current hydraulic shock through said each filtering element.

4,462,917

METHOD AND COMPOSITIONS FOR FRACTURING SUBTERRANEAN FORMATIONS

Michael W. Conway, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 27, 1982, Ser. No. 423,573

Int. Cl.³ E21B 43/26

U.S. Cl. 252—8.55 R **21 Claims**

1. An aqueous gel comprising:

an aqueous fluid comprising a water-alcohol solution having from about 0 to 80 percent alcohol by volume;

a gelling agent comprising a solvatable polysaccharide having a molecular weight in excess of about 100,000 present in an amount sufficient to gel said aqueous fluid; and

a retarded crosslinking composition, present in an amount sufficient to crosslink at least a portion of said gelling agent, comprising an organotitanate chelate, a polyhydroxyl-containing compound comprising at least one member selected from the group consisting of glycerol, erythritol, threitol, ribitol, arabinitol, xylitol, allitol, altritol, sorbitol, mannitol, dulcitol, iditol, and perseitol and an aqueous fluid, said retarded crosslinking composition having been aged for a period of from about 3 to about 12 weeks prior to admixing with said solvatable polysaccharide and said consitiuents of said retarded crosslinking composition being present in a volumetric ratio, respectively, in the range of from about 1:0.05:0.05 to about 1:10:10.

4,462,918

LUBRICATING OIL COMPOSITION

Peter H. D. Matthews, Tarvin, and Derek W. Morecroft, Bromborough, both of England, assignors to Shell Oil Company, Houston, Tex.

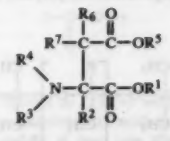
Filed Feb. 8, 1983, Ser. No. 464,834

Claims priority, application United Kingdom, Feb. 17, 1982, 8204596

Int. Cl.³ C10M 1/48, 1/32

U.S. Cl. 252—32.7 E **7 Claims**

1. A lubricating oil composition comprising a major proportion of a lubricating oil and from 0.1 to 5 percent by weight of a Group II metal dithiophosphate and from 0.01 to 5 percent by weight of a compound having the formula



wherein R^1, R^2, R^5, R^6 and R^7 each are hydrogen or hydrocarbon containing 1 to 30 carbon atoms, and wherein R^3 and R^4 are independently selected from hydrogen, hydrocarbon containing from 1 to 30 carbon atoms, and acyl containing from 1 to 30 carbon atoms.

4,462,919

FERROMAGNETIC RESIN COMPOSITION CONTAINING POLYMERIC SURFACE PRECOATED MAGNETIC RARE EARTH COBALT POWDERS

Takehide Saito, Osaka, and Yasuo Nakagawa, Nishinomiya, both of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 480,976, Mar. 31, 1983, abandoned. This application Dec. 9, 1983, Ser. No. 560,062
Claims priority, application Japan, Apr. 2, 1982, 57-53745
Int. Cl.³ H01F 1/04, 1/26, 1/37; C08K 3/08
U.S. Cl. 252—62.54 18 Claims

1. A ferromagnetic resin composition consisting essentially of a thermoplastic resin filled with 70 to 97% by weight of magnetic rare earth-cobalt powder haing a particle size of 2 to 10μ, the surface of which has been pre-coated with 0.1 to 5% by weight of a thermosetting resin or a thermoplastic resin.

4,462,920

WATER-BASED HYDRAULIC FLUIDS

Kenneth L. Snyder, Jr., and Kenneth L. Foster, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 6, 1983, Ser. No. 501,345
Int. Cl.³ C10M 3/04, 3/12
U.S. Cl. 252—75 15 Claims

1. A substantially oil-free hydraulic fluid or metalworking composition which maintains a Newtonian and shear stable viscosity comprising an aqueous liquid and a substantially water-swellable synthetic addition polymer comprising the reaction product of (1) at least one water-aoluble ethylenically unsaturated monomer in an amount sufficient to provide swellability to said polymer, (2) at least one water-insoluble ethylenically unsaturated monomer in an amount sufficient to control the degree of swellability of said polymer, (3) at least one ethylenically unsaturated polyalkyleneoxy-containing monomer in an amount sufficient to impart thickening efficiency to the polymer at high shear rates while not suffering significant deformation, and (4) at least one polyvinyl crosslinking monomer in an amount sufficient to control the degree of swellability of said copolymer while imparting mechanical reinforcement to said polymer.

4,462,921

SILOXANE STABILIZERS FOR INORGANIC SILICATES IN ANTIFREEZE/COOLANT FORMULATIONS

Edward S. Peterson, and Jerome W. Darden, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

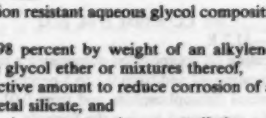
Filed Jan. 24, 1983, Ser. No. 460,435
Int. Cl.³ C09K 5/00
U.S. Cl. 252—78.3 6 Claims

1. A gellation resistant aqueous glycol composition comprising

(a) 85 to 98 percent by weight of an alkylene glycol, an alkylene glycol ether or mixtures thereof,

(b) an effective amount to reduce corrosion of an inorganic alkali metal silicate, and

(c) an effective amount to improve gellation resistance of a glycol soluble organosiloxane polymer having the formula



where n is an integer from 1 to 20 and R is selected from the group consisting of a cyano-terminated moiety, a diol ether moiety, a carboxylic acid moiety and an amide moiety.

4,462,922

ENZYMATIC LIQUID DETERGENT COMPOSITION

Jelles V. Boskamp, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 2, 1982, Ser. No. 438,665
Claims priority, application United Kingdom, Nov. 19, 1981, 8134887
Int. Cl.³ C11D 3/386, 7/10, 1/94
U.S. Cl. 252—174.12 6 Claims

1. An aqueous enzymatic liquid detergent composition comprising:

(a) from 1 to 60% by weight of an anionic, nonionic, cationic, zwitterionic active detergent material or mixtures thereof,

(b) from 0.001 to 10% by weight of proteolytic, amylolytic, cellulolytic enzymes or mixtures thereof,

(c) from 2 to 15% by weight of boric acid or an alkalimetal borate,

(d) from 2 to 25% by weight of a polyhydroxy compound selected from the group consisting of ethyleneglycol, propylene glycol, 1,2-propanediol, butyleneglycol, hexyleneglycol, glycerol, mannitol, sorbitol, erythritol, glucose fructose, lactose, erythritol-1,4-anhydride, and mixtures thereof, the weight ratio of (d):(c) being from 1:1 to 2:1,

(e) from 5 to 20% by weight of a reducing alkalimetal salt selected from the group consisting of alkalimetal-sulphites, -bisulphites, -metabisulphites, -thiosulphates and mixtures thereof, and

(f) from 5 to 70% by weight of water.

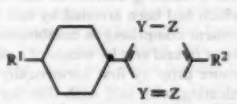
4,462,923

DISUBSTITUTED PYRIMIDINES

Arthur Boller, Binningen; Martin Schadt, Seltisberg, and Alois Villiger, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 7, 1981, Ser. No. 309,421
Claims priority, application Switzerland, Oct. 14, 1980, 7653/80
Int. Cl.³ C09K 3/34; G02F 1/13; C07D 239/26
U.S. Cl. 252—299.61 88 Claims

1. A compound of the formula:



wherein Y is nitrogen and Z is =CH—, or Z is nitrogen and Y is =CH—; R^1 is alkyl and R^2 is cyano, alkyl, p-alkylphenyl or trans-4-alkylcyclohexyl; where each alkyl denotes either a straight chain alkyl group of 1 to 12 carbon atoms or a branched chain alkyl group of the formula C_2H_5—CH(CH-3)—$(CH_2)_m$, n is 1, 2 or 3; with the proviso that the compound contains at most only one of said branched chain alkyl group and with the further proviso that the sum of the carbon atoms in all of the alkyl groups within the compound is at most 14.

4,462,924

LIQUID CRYSTAL MATERIALS AND DEVICES

Edward P. Raynes, Malvern, England, assignor to The Secretary of State in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 72,692, Sep. 5, 1979, abandoned. This application Sep. 10, 1982, Ser. No. 416,608

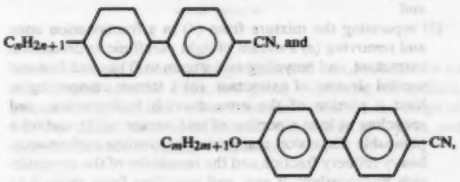
Claims priority, application United Kingdom, Sep. 13, 1978, 36595/78; Oct. 13, 1978, 40580/78

Int. Cl.³ C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299.63 14 Claims

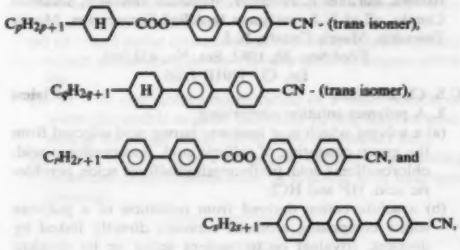
1. A liquid crystal material for multiplex addressed liquid crystal displays comprising

(1) at least one member selected from the group consisting of



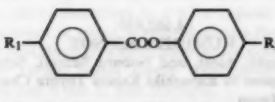
wherein m and n are integers and n=2 or 4 or m=3 in at least one of said materials,

(2) a liquid crystal material comprising a member selected from the group consisting of



wherein p, q, r, and s are integers, and

(3) at least one ester having the formula



wherein R_1 and R_2 are straight chain alkyl;

said ester (3) forming between 10% and 90% by weight of the total mixture and said liquid crystal material (2) forming between 5% and 30% by weight of the total mixture.

4,462,925

STABLE SOLUTIONS OF OPTICAL BRIGHTENERS

Peter S. Littlewood, Ilkley, England, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 230,547, Feb. 2, 1981, abandoned. This application Nov. 27, 1981, Ser. No. 325,104

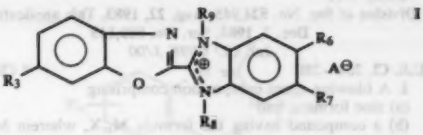
Claims priority, application United Kingdom, Feb. 5, 1980, 8003862

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—301.28 22 Claims

1. A stable aqueous solution comprising

(a) 5–25% by weight of an optical brightening agent of formula I



I

in which

$A^{\ominus}$ is an anion,

R_3 is C_{1-4}alkoxy, unsubstituted or monosubstituted by phenyl or by (C_{1-4}alkoxy)carbonyl;

one of R_6 and R_7 is hydrogen or methyl and the other is hydrogen;

R_8 is C_{1-4}alkyl unsubstituted or monosubstituted by phenyl or by (C_{1-4}alkoxy)carbonyl, and

R_9 is C_{1-4}alkyl,

(b) 5–70% by weight of an organic monobasic acid or a mixture of organic monobasic acids selected from formic, acetic, propionic, butyric, glycollic and lactic acids,

(c) 10–45% by weight citric acid,

(d) 5–55% by weight water,

the total amount of organic acids present being at least 40% by weight of the total composition, and the total amount of components a, b, c and d being at least 90% of the total solution.

4,462,926

THIXOTROPISING AGENTS FOR UNSATURATED POLYESTER RESINS

Klaus Prater, Krefeld, and Heinz Keesen, Moers, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,519

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135183

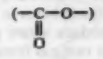
Int. Cl.³ B01J *13/00*

U.S. Cl. 252—315.1 3 Claims

1. Thixotropising agents consisting of

(A) at least one cyclohexyl amide of a saturated fatty acid which acid contains at least 10 carbon atoms, and

(B) one or more oligomeric ester amides having an average molecular weight $\bar{M}_n$ of from 600 to 3000, a carboxylic acid amide (—CO—NH—) group content of from 1.5 to 15% by weight and a carboxylate



group content of from 2 to 13% by weight, of

(a) at least one unsaturated fatty acid containing at least 10 carbon atoms and/or at least one aliphatic dicarboxylic acid containing at least 10 carbon atoms,

(b) at least one cycloaliphatic diol containing from 6 to 18 carbon atoms, and

(c) at least one aliphatic diamine containing from 2 to 10 carbon atoms, and/or

(C) one or more bis-imides of
(a) at least one aliphatic, cycloaliphatic or aromatic C_4–C_{12}-dicarboxylic acid forming cyclic imides, and
(b) at least one aliphatic diamine containing from 2 to 10 carbon atoms,
with the proviso that the ratio by weight of components A:B:C is from 1:0.4:1 to 1:2.3:2.5 or, in the absence of B or C, the ratio by weight of components A:B or A:C is from 1:0.4 to 1:1.97.

4,462,927

BLOWING AGENT COMPOSITION CONTAINING ZINC FORMATE AND METAL SALT ACTIVATOR

Byron A. Hunter, Alpine, Utah, assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 524,945, Aug. 22, 1983. This application Dec. 7, 1983, Ser. No. 559,115
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—350 **1 Claim**

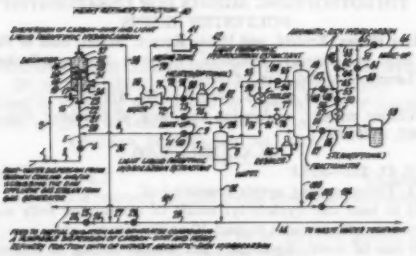
1. A blowing agent composition comprising
(a) zinc formate, and
(b) a compound having the formula M_mX, wherein M is sodium or potassium; X is chlorine, bromine, iodine, CO_3, HCO_3, SO_4, SO_3, S_2O_3, NO_2, SCN, OCN, BO_2, HBO_3, HPO_4, PO_4 or H_2PO_4, and m is an integer representing the valence of X; or a compound having the formula $M_n^1R_p$, wherein M^1 is alkali metal, calcium, lead or zinc, R is organic mono- or polybasic acid having 1–18 carbon atoms and from 0 to 2 nitrogen atoms, or a benzenesulfonyl or toluenesulfonyl radical; and n and p are integers representing the valences of R and M^1, respectively or whole fractions thereof.

4,462,928

PARTIAL OXIDATION OF HEAVY REFINERY FRACTIONS

Roger M. Dille, Port Arthur; Harold A. Rhodes, and Susan B. Wallon, both of Beaumont, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,637
Int. Cl.³ B01D *3/34*; C07C *1/02*; C10K *1/10*; C01B *3/24, 3/36*
U.S. Cl. 252—373 **16 Claims**



1. In the process for the partial oxidation of a hydrocarbonaceous fuel with a free oxygen-containing gas in the reaction zone of a free-flow noncatalytic gas generator at a temperature in the range of about 1700° to 3500∞ F. and a pressure in the range of about 1 to 300 atmospheres in the presence of a temperature moderator to produce a raw gas stream comprising H_2, CO, H_2O and at least one gas from the group CO_2, H_2S. COS, CH_4, N_2, A, and containing entrained soot; contacting the raw gas stream with water in a gas quenching and/or scrubbing zone to produce a soot-water dispersion; separating said soot in a decanting zone; and recycling at least a portion of said soot to said gas generator as a portion of the feed, the improvement comprising:
(1) mixing a stream of said soot-water dispersion with a first stream of light paraffinic hydrocarbon extractant, and introducing said mixture into a decanter along with a second stream of light paraffinic hydrocarbon extractant; wherein said light paraffinic hydrocarbon extractant is selected from the group consisting of butane, pentane, hexane, light straight run naphtha, and mixtures thereof;
(2) removing from said decanter a stream of particulate carbon and soot dispersed in light paraffinic hydrocarbon extractant, and a separate stream of ash dispersed in grey water;
(3) mixing together an asphaltene containing heavy refinery fraction having an initial boiling point in the range of about 650° F.–1300° F. and being selected from the group consisting of very heavy residua from the refining of petroleum, asphalt residuum from solvent deasphalting and the bottoms product from the hydrogenation and hydrocracking of residua or heavy crude oil with an aromatic-rich hydrocarbon liquid or vapor containing from about 20–100 wt. % aromatics to produce a first single liquid phase pumpable mixture;
(4) mixing together the mixture from (3) with the dispersion of particulate carbon-soot-light paraffinic hydrocarbon extractant from (2) to produce a second single liquid phase pumpable mixture with no precipitation of asphaltenes; and
(5) separating the mixture from (4) in a fractionation zone and removing (a) a stream of light paraffinic hydrocarbon extractant, and recycling said stream to (1) as said first and second streams of extractant; (b) a stream comprising at least a portion of the aromatic-rich hydrocarbon, and recycling at least a portion of said stream to (3); and (c) a pumpable dispersion comprising particulate carbon-soot-heavy refinery fraction and the remainder of the aromatic-rich hydrocarbon, if any, and recycling from about 0 to 100 wt. % of said stream to the partial oxidation gas generator, and removing the remainder, if any, of said dispersion stream.

4,462,929

SOLUTION OF A CHALCOGEN-CONTAINING POLYMER IN ACIDS AND PROCESS OF FORMING POLYMER ARTICLES THEREFROM

Lawrence W. Shacklette, Maplewood; Granville G. Miller, Morristown, and Jane E. Frommer, Mendham Township, Somerset County, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 30, 1982, Ser. No. 432,043
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—518 **9 Claims**

1. A polymer solution comprising:
(a) a solvent which is at least one strong acid selected from the group consisting of sulfuric acid, fluorosulfonic acid, chlorosulfonic acid, perfluoroalkylsulfonic acids, perchloric acid, HF and HCl;
(b) a solute cation derived from oxidation of a polymer solute comprising aromatic moieties directly linked by divalent, trivalent or tetravalent sulfur or by divalent oxygen and
(c) a dopant solute comprising a halide or oxyhalide anion of a group IIIA, IIIB, IVA, IVB, VA, VB, VIIIA or VIB metal or metalloid or a halide or oxyhalide anion of phosphorus, selenium, sulfur or boron or is the product of the reduction of a reducible strong acid or of sulfur trioxide by said polymeric solute.

4,462,930

HUMIDITY SENSOR

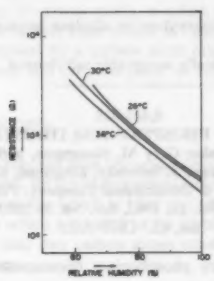
Toshihiko Suzuki, Aichi, and Noboru Matsui, Seto, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Dec. 1, 1982, Ser. No. 446,034
Claims priority, application Japan, Dec. 7, 1981, 56-196534
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—519 **7 Claims**

1. A humidity sensor having electrical resistance variable in

response to the change of relative humidity, comprising a sintered compact consisting essentially of material of a spinel structure represented by the formula

$$M_{1-x}A_xFe_2O_{4-\alpha}$$



where M stands for one of magnesium and zinc, A stands for an alkali metal selected from the group consisting of sodium, potassium and lithium, x is a numerical value in the range of 0.001 to 0.2 so that M is substituted with 0.1 to 20% of A, and α is the number of oxygen vacancies.

4,462,931

ENHANCED AQUEOUS CHEMILUMINESCENT SYSTEMS

Martin L. Cohen, White Plains, N.Y.; Frank J. Arthen, Jr., Washington, and Shin-Shyong Tseng, Bridgewater, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 16, 1982, Ser. No. 388,854
Int. Cl.³ C09K *11/06*
U.S. Cl. 252—700 **6 Claims**

1. A composition for generating chemiluminescence comprising, in aqueous solution:

(a) 10^{-3} to 5 molar concentration of a water-soluble reactant which generates light by reaction with hydrogen peroxide,

(b) 10^{-5} to one molar concentration of a water-soluble or water dispersible organic fluorescer having spectral emission in the range about 300 to 1000 nanometers and,

(c) 0.1 to 5% by wt of a surfactant, capable of producing enhanced chemiluminescence on reaction with hydrogen peroxide.

4,462,932

ISOLATION OF NATIVE CASEIN BY CRYODESTABILIZATION

Dennis A. Lonergan, Oakdale, Minn., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Jun. 22, 1983, Ser. No. 506,792
Int. Cl.³ A23J *1/20, 1/22*
U.S. Cl. 260—119 **33 Claims**

1. A method for processing milk to isolate substantially all of the native casein therefrom in a form capable of forming a stable suspension in water, which comprises the steps of

filtering milk through a membrane which substantially completely retains native casein while generally allowing lactose and water to pass through,

withdrawing the retentate,

storing the retentate at a temperature below the freezing point thereof,

thawing the retentate, and

separating the native casein therefrom in the presence of added water.

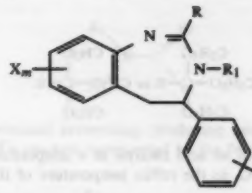
4,462,933

PROCESS FOR PREPARING 4-PHENYL-1,3-BENZODIAZEPINES

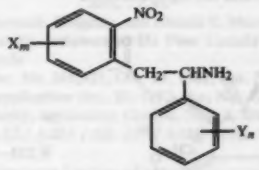
Lawrence L. Martin, Lebanon, N.J.; Manfred Worm, Wiesbaden-Naurod, Fed. Rep. of Germany, and Charles A. Crichlow, Piscataway, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Incorporated, Somerville, N.J.

Division of Ser. No. 91,062, Nov. 5, 1979, Pat. No. 4,309,424, which is a continuation-in-part of Ser. No. 948,896, Oct. 5, 1978, abandoned. This application Sep. 8, 1981, Ser. No. 300,015
Int. Cl.³ C07D *243/04*
U.S. Cl. 260—239 BD **3 Claims**

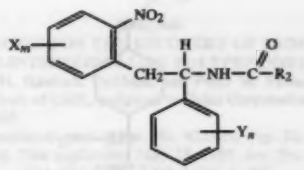
1. A method of preparing a compound of the formula



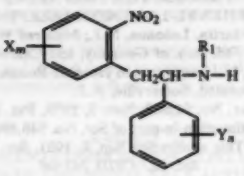
in which R is hydrogen or alkyl of from 1 to 5 carbon atoms; R_1 is alkyl of from 1 to 5 carbon atoms, cycloalkylalkyl of from 4 to 8 carbon atoms or aralkyl having from 1 to 5 carbons in the alkyl moiety, and the aryl portion of the aralkyl being phenyl or phenyl substituted with one of more chloro, bromo, fluoro, methoxy, alkyl of 1 to 5 carbon atoms, hydroxy or trifluoromethyl groups, X and Y are the same or different and each can be hydrogen, chlorine, bromine, fluorine, methoxy, alkyl of from 1 to 3 carbon atoms, hydroxy, or trifluoromethyl; m is the integer 1 or 2; n is the integer 1, 2 or 3; and the optical antipodes thereof; or a physiologically acceptable salt thereof, which comprises converting a 2-nitro-α-phenylphenethylamine of the formula



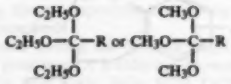
to the corresponding amide of the formula



in which R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, cycloalkyl or cycloalkylalkyl of up to 7 carbon atoms, or aryl or aralkyl wherein the alkyl has up to 4 carbon atoms and wherein the aryl is defined as in the definition of R_1, by reaction with a a carboxylic acid halide or anhydride; reducing said amide with diborane to provide the corresponding 2-nitro-α-phenylphenethylamine of the formula



reducing said 2-nitro-α-phenylphenethylamine to provide the corresponding 2-amino-α-phenylphenethylamine and cyclizing said 2-amino-α-phenylphenethylamine with a compound of the formula



in the presence of an acid catalyst at a temperature ranging from about 35° C. to the reflux temperature of the reaction mixture.

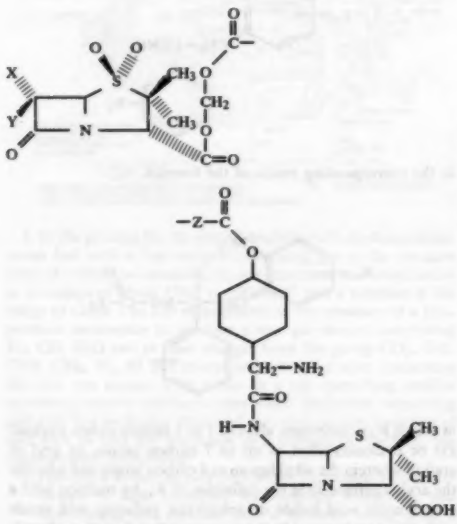
4,462,934

BIS-ESTERS OF DICARBOXYLIC ACIDS WITH AMOXICILLIN AND CERTAIN HYDROXYMETHYLPENICILLANATE 1,1-DIOXIDES

Vytautas J. Jasys, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Mar. 31, 1983, Ser. No. 481,108
Int. Cl.³ C07D 499/48
U.S. Cl. 260—239.1 **13 Claims**

1. A compound having the formula



wherein

and Z is 1,4-cyclohexylene or alkylene having from 1 to 6 carbon atoms;
or a pharmaceutically acceptable salt thereof.

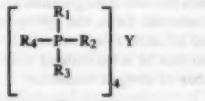
4,462,935

QUATERNARY PHOSPHONIUM THIOSTANNATES

Judith B. Onopchenko; Gary M. Singerman, both of Monroeville, Pa., and Raynor T. Sebulsky, Kingwood, Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

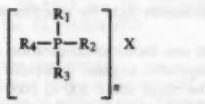
Filed Jul. 12, 1982, Ser. No. 397,580
Int. Cl.³ C07F 7/22
U.S. Cl. 260—429.7 **7 Claims**

1. The quaternary phosphonium thiostannate having the formula:



where Y is tetrathiostannate, SnS_4, or hexathiodistannate, Sn_2S_6; R_1, R_2, R_3 and R_4 are independently selected from alkyl, alkenyl, hydroxyalkyl and hydroxyalkenyl having from 1 to about 20 carbon atoms, and the sum of the carbon atoms in R_1, R_2, R_3 and R_4 is between about 4 and about 80.

3. The method for making quaternary phosphonium thiostannates which comprises reacting a water-soluble thiostannate salt independently selected from alkali metal and ammonium salts of tetrathiostannic acid and hexathiodistannic acid, in aqueous solution, with a solution of a quaternary phosphonium salt having the formula:



in a solvent therefor, where R_1, R_2, R_3 and R_4 are independently selected from alkyl, alkenyl, hydroxyalkyl and hydroxyalkenyl having from one to about 20 carbon atoms; the total number of carbon atoms in R_1, R_2, R_3 and R_4 is between about 4 and about 80; n is the valence of X; and X is selected from chlorine, bromine, iodine, sulfate, hydrogen sulfate, lower alkyl sulfate and lower alklyl carboxylate, and recovering a quaternary phosphonium thiostannate reaction product from the reaction mixture by dissolution in a water-immiscible organic solvent, and separation of the water-immiscible organic solution from the aqueous solution.

4,462,936

REACTION PRODUCTS OF SILICIC ACID ESTERS AND ORGANIC TIN COMPOUNDS

Wolfgang Hechtl, Burghausen, and Arnold Garhammer, Simbach, both of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 295,961, Aug. 25, 1981, Pat. No. 4,360,654.
This application Jul. 22, 1982, Ser. No. 400,568
Int. Cl.³ C07F 7/22
U.S. Cl. 260—429.7 **4 Claims**

1. A mixture containing (1) a product obtained from the

reaction of (a) silicic acid ester and (b) an organic tin compound of the formula

$$R_2Sn(OCOR^1)_2 \quad (I),$$

wherein R is selected from the group consisting of a butyl and an octyl radical, R^1 is a monovalent hydrocarbon radical having from 1 to 15 carbon atoms, in which only one of the valences of the carbon atom which is bonded to the carboxyl group is saturated by a carbon atom other than that of the carboxyl group and (2) an organic tin compound of the formula

$$R_2Sn(OCOR^2)_2 \quad (II),$$

wherein R is selected from the group consisting of a butyl and an octyl radical, R^2 is a hydrocarbon radical having from 3 to 15 carbon atoms, in which at least two of the valences of the carbon atom which is bonded to the carboxyl group are saturated by at least two carbon atoms other than those of the carboxyl group.

4,462,937

PROCESS FOR THE PREPARATION OF TRIFLUOROMETHYLBENZENES FROM THE CORRESPONDING TRICHLORO- OR TRIBROMO-METHYLBENZENES

Ramanadin, Ales, and Laurent Seigneurin, Salindres, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 12, 1981, Ser. No. 243,205

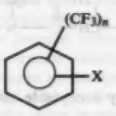
Claims priority, application France, Mar. 17, 1980, 80 05877

Int. Cl.³ C07C *51/04, 17/20*

U.S. Cl. 260—544 F **11 Claims**

1. A process for the preparation of a trifluoromethylbenzene from the corresponding trichloro- or tribromomethylbenzene with hydrofluoric acid comprising passing an ascending stream of gaseous hydrofluoric acid countercurrently through a plurality of separate mobile successive liquid layers of the trichloro- or tribromomethylbenzene at a temperature between about 80° C. and 150° C. in the absence of catalyst.

10. The process according to claim 1 wherein said trifluoromethylbenzene is selected from the group of trifluoromethylbenzenes having the formula:



wherein x represents at least one substituent selected from the group consisting of H, Cl, F, Br, COF, CF_3, COCl, COBr and combinations thereof, and n is an integer that is greater than or equal to 1.

4,462,938

PROCESS FOR PRODUCING CHALCOGEN CONTAINING COMPOUNDS

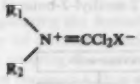
Fred Wudl, Far Hills, N.J., assignor to AT & T Bell Laboratories, Murray Hill, N.J.

Filed May 15, 1980, Ser. No. 149,993

Int. Cl.³ C07C *155/04, 163/00*; C07D *421/04, 409/04*

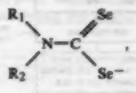
U.S. Cl. 260—550 **9 Claims**

1. In a process for the synthesis of tetraselenafulvalenes comprising the steps of performing a series of reactions utilizing a diselenocarbamate as a reactant to ultimately form said tetraselenafulvalene, the improvement comprising the synthesis of said diselenocarbamate through the reaction of a reactant represented by the formula

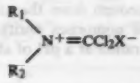


with the selenium containing entity produced by the combination of hydrogen selenide with a mild non-nucleophilic base wherein R_1 and R_2 are hydrocarbon residues which are sufficiently small that prevention of said reaction through steric hindrance is substantially avoided and wherein X^- comprises an anion.

7. A process for producing a compound represented by the formula



the improvement comprising producing said compound by reaction of a reactant represented by the formula



with the selenium containing entity produced by the combination of hydrogen selenide with a mild non-nucleophilic base wherein R_1 and R_2 are hydrocarbon residues which are sufficiently small that prevention of said reaction through steric hindrance is substantially avoided and wherein X^- comprises an anion.

4,462,939

RECOVERY OF A PROTEINACEOUS OAT FRACTION FROM A DISPERSION THEREOF IN HYDROCARBON SOLVENT

John R. B. Boocock, Kingston, and Ronald E. Murray, Napanee, both of Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Division of Ser. No. 315,921, Oct. 28, 1981, Pat. No. 4,407,841. This application Sep. 20, 1982, Ser. No. 420,479

Claims priority, application Canada, Nov. 6, 1980, 364117

Int. Cl.³ A23J *1/00, 1/12, 3/00*; C07G *7/00*

U.S. Cl. 260—112 R **7 Claims**

1. A proteinaceous fraction of oats having a protein content of at least 50%, by weight, and a bulk density of less than 0.14 g/ml.

4,462,940

PROCESS FOR THE RECOVERY OF HUMAN β-INTERFERON-LIKE POLYPEPTIDES

Wolfgang H. Hanisch, Oakland, and Peter M. Fernandes, Lafayette, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Continuation-in-part of Ser. No. 422,421, Sep. 23, 1982, abandoned. This application May 18, 1983, Ser. No. 495,896

Int. Cl.³ C07G *7/00*; A61K *45/02*

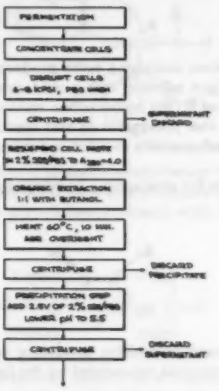
U.S. Cl. 260—112 R **32 Claims**

1. In a process for the recovery of a lipophilic protein from a microorganism transformed to produce said protein wherein the steps comprise:

solubilizing said protein in an aqueous medium with an appropriate solubilizing agent;

extracting said solubilized protein from the aqueous medium

with an aliphatic alcohol selected from the group consisting of 2-butanol, 2-methyl-2-butanol and mixtures thereof;



precipitating said protein from the alcohol phase; the improvement which comprises purifying said precipitated protein by diafiltration at a pH of about 10.5 to 12.5.

4,462,941

DYNORPHIN AMIDE ANALOGS

Nancy M. Lee; Horace H. Loh, both of San Francisco, and Jaw-Kang Chang, San Carlos, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 10, 1982, Ser. No. 387,005

Int. Cl.³ C07C *103/52*; A61K *37/00*

U.S. Cl. 260—112.5 R **3 Claims**

1. A dynorphin analog having the sequence

TYR-GLY-GLY-PHE-LEU-ARG-ARG-AA^8-AA^9-AA^{10}

wherein AA^8 is isoleucine, leucine or lysine, AA^9 is arginine or proline, AA^{10} is proline and a carbonyl carbon at the AA^{10} terminus is amidated.

4,462,942

A47934 ANTIBIOTIC AND PROCESS FOR PRODUCTION THEREOF

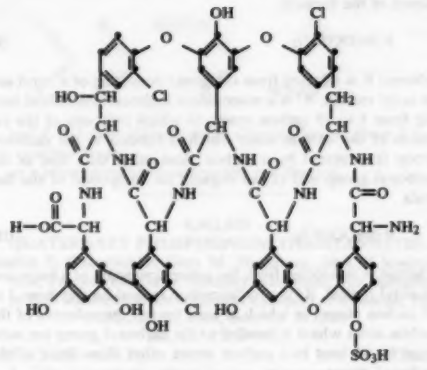
Robert L. Hamill, Greenwood, and Ralph E. Kastner, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 30, 1982, Ser. No. 403,842

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. Antibiotic A47934, which has the structure



and the pharmaceutically-acceptable, non-toxic salts thereof.

4,462,943

CARBOXYALKYL AMINO ACID DERIVATIVES OF VARIOUS SUBSTITUTED PROLINES

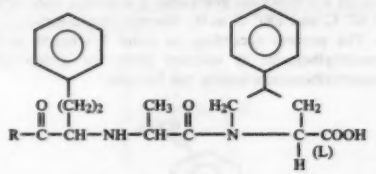
Edward W. Petrillo, Jr.; Eric M. Gordon, both of Pennington; John Krapcho, Somerset, and Peter W. Sprague, Pennington, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 209,563, Nov. 24, 1980, abandoned. This application Sep. 28, 1981, Ser. No. 306,553

Int. Cl.³ C07C *103/52*; A61K *37/00, 31/40*

U.S. Cl. 260—112.5 R **6 Claims**

1. A compound of the formula



and a pharmaceutically acceptable salt thereof wherein R is hydroxy or ethoxy.

4,462,944

CARBURETOR WITH ROTARY MIXING VALVE

Ellis H. Sprick, 2855 Flintlock St., Eugene, Oreg. 97401

Filed Dec. 27, 1982, Ser. No. 453,614

Int. Cl.³ F02M *25/02, 25/14*

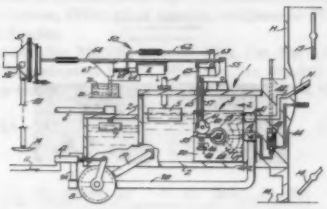
U.S. Cl. 261—18 A **10 Claims**

1. A valve for the mixing of liquids in an automotive fuel system, said valve comprising,

a housing defining a primary port, an auxiliary port, a mixing chamber and a discharge port, and

primary and auxiliary valve components adapted for coaxial rotational movement within said housing, each of said valve components including an arm disposed within said housing with the primary component distal arm end located adjacent said primary port to regulate a flow therethrough and the auxiliary distal arm end located adjacent said auxiliary port to regulate a flow therethrough into

said mixing chamber, said primary and auxiliary components having segments located exteriorly of said housing



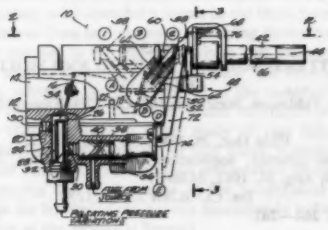
and thereat adapted for actuation by a valve control assembly.

4,462,945

CONTROL MECHANISM FOR A CARBURETOR

Peter W. Brown, North Muskegon, Mich., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 26, 1980, Ser. No. 134,129
Int. Cl.³ F02M *1/02*
U.S. Cl. 261—50 R **9 Claims**



1. A carburetor comprising an air induction passage, a choke valve operatively movable in said air induction passage, a float bowl, a fuel inlet valve selectively operable for controlling introduction of fuel from a source into said float bowl, means including an orifice communicating between said float bowl and said air induction passage, control means having an axis and operative for movement axially along and rotationally about said axis, and linkage means operatively connecting said control means with said choke valve and said fuel inlet valve for operating said choke valve in response to one of the axial and rotational movements of said control means and for operating said fuel inlet valve in response to the other one of the axial and rotational movements of said control means.

4,462,946

APPARATUS AND METHOD FOR PRODUCING REINFORCED PLASTIC COMPOSITE ARTICLES OF NON-UNIFORM SHAPE AND NON-UNIFORM VOLUME

William B. Goldsworthy, Palos Verdes Estates, Calif., assignor to Goldsworthy Engineering, Inc., Torrance, Calif.

Filed Oct. 12, 1982, Ser. No. 433,812
Int. Cl.³ B29C *17/14*; D04H *3/07*
U.S. Cl. 264—23 **67 Claims**

1. An apparatus for producing a fiber reinforced plastic article which may have a non-uniform shape over its length, said apparatus comprising:

(a) means for providing a rope of a formable and curable material in a general shape and size so that it can be used in the production of a reinforced plastic article,

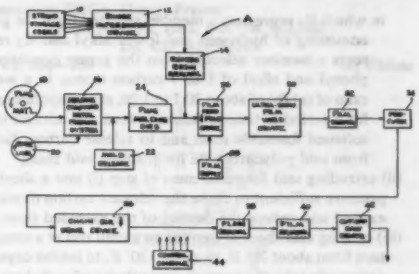
(b) means for providing a continuous carrier string to receive and carry and move the formable and curable material,

(c) means for separating the formable and curable material into a plurality of discrete sections while on said carrier string without severing the carrier string and where each discrete section becomes a plug which will remain in and become part of a final reinforced plastic article,

(d) means for shaping each discrete section into a formable and curable material plug of a desired shape and which material used in the forming of said plug has a consistency to generally retain such shape, and which plug is carried by said string,

(e) means for enclosing at least a portion of said plug in a fiber reinforced plastic layer impregnated with a curable binder to form a plug containing composite thereof,

(f) means for wrapping said plug containing composite in a film generally adopting the shape of the layer surrounding



at least said portion of said plug to form a film enclosed plug containing composite having a length and where the shape of and volume of material in said composite over its length is not necessarily uniform,

(g) means to initiate a cure of said curable matrix and said plug of formable and curable material when said film enclosed composite is in the desired shape by simultaneously applying a curing energy to the curable binder and to the plug of material to simultaneously harden same and cause them to become bound together to form said reinforced plastic article, so that said article has a first portion with a larger cross-sectional shape than an adjacent second portion, and

(h) means to separate said reinforced plastic article from said continuous carrier string and other reinforced plastic articles which may be formed on and carried by said string.

4,462,947

HEAT-RESISTANT FOAMED POLYESTERS

Mark T. Huggard, Cranbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

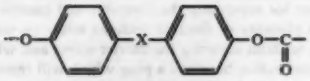
Filed Dec. 28, 1982, Ser. No. 454,202
Int. Cl.³ B29H *7/20*; C08J *9/02*
U.S. Cl. 264—54 **4 Claims**

1. A process for preparing a thermoformed, foamed, crystalline, high molecular weight linear polyester sheet, said process comprising the steps of:

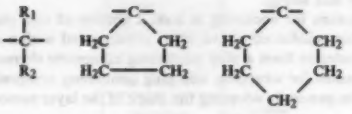
(i) reacting a homogeneous mixture consisting essentially of:

(a) a high molecular weight linear polyester, which is a polycondensation product of an aromatic dicarboxylic acid and a glycol; and

(b) a high molecular weight linear aromatic polycarbonate represented by the repeating structural unit of the formula:



wherein X is a divalent hydrocarbon radical with a total of from 2 up to about 9 carbon atoms selected from the group consisting of



in which R_1 represents a member selected from the group consisting of hydrogen and lower alkyl and R_2 represents a member selected from the group consisting of phenyl and alkyl of 1 to 7 carbon atoms, in a weight ratio of (a):(b) of about 20:1 to 1:20, at a temperature and for a period of time sufficient to form the mixture into a softened foamable mass and to release carbon dioxide from said polycarbonate for foaming said mass;

(ii) extruding said foamable mass of step (i) into a sheet at a pressure sufficient to cause the released carbon dioxide to expand and reduce the density of the extruded sheet;

(iii) cooling said sheet of step (ii) on a chill roll at a temperature from about 70° F. to about 120° F. to inhibit crystallization whereby the average crystallinity of said sheet is in the range from about 0% to about 18%;

(iv) contacting said sheet of step (iii) with a mold which is at a temperature in the range of from about 240°-350° F.;

(v) applying forces comprising a differential in applied pressure to said sheet of step (iv) so as to make said sheet conform to said mold, whereby a thermoformed sheet is made;

(vi) allowing said thermoformed sheet of step (v) to remain in contact with said mold until an average crystallinity of at least about 20% is achieved; and

(vii) removing said thermoformed sheet of step (vi) from said mold.

4,462,948

DISPERSION PROCESS FOR PREPARING THERMOPLASTIC RESIN FIBER

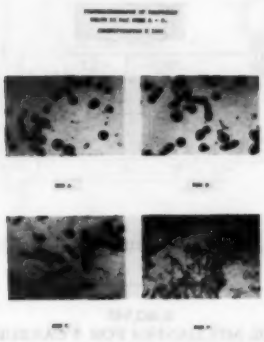
Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 354,977

Int. Cl.³ C08F 6/14

U.S. Cl. 264—140 **15 Claims**

1. A process for obtaining olefin-polar comonomer resin in fibrous form which comprises vigorously agitating an olefin-polar-comonomer resin in molten form in water in the presence of a resin dispersion-forming amount of an alkali metal soap and a fiber-forming amount of base of from about 0.5 to about 10 parts by weight per 100 parts by weight of resin at a temperature below the degradation temperature of resin to provide a dispersion of said resin in which a substantial number of the individual resin particles are in the form of a fiber possessing an average length of from about 50 to about 2500 microns and an average length to diameter ratio of at least about 3:1 and thereafter cooling said dispersion to below the solidification point of the resin.



4,462,949

BATTERY-MOLDING METHOD AND MOLDING APPARATUS

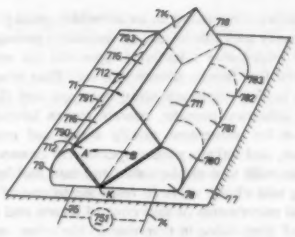
Hans B. Fehlmann, Seestrasse 160, CH-8700 Küsnacht, Switzerland

Filed Dec. 28, 1981, Ser. No. 335,093

Claims priority, application Switzerland, Dec. 30, 1980, 9631/80; Aug. 24, 1981, 5426/81

Int. Cl.³ B28B 7/08, 21/56

U.S. Cl. 264—261 **17 Claims**



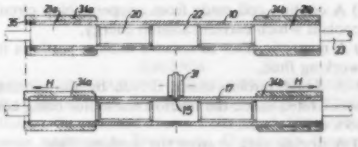
1. In the method of producing a plurality of metal-reinforced panels in a molding box having a cavity defined by a bottom wall, two side walls and two front walls, in which method a number of reinforcing metal elements is arranged in said cavity with a partitioning means between any two adjacent elements, wherein said partitioning means having mold release properties, and wherein a flowable and hardenable material is fed into said cavity and is allowed to harden therein so as to form said metal-reinforced panels; said reinforcing metal elements each having a generally stratiform biplanar structure formed of at least two distanced metal sheets maintained in a substantially parallel and mutually supporting arrangement; the improvement comprising at least some of said partitioning means being molding boards in a laterally unguided connection with said walls, the distance between any two adjacent boards being determined essentially by said biplanar structures, and tilting said molding box by means of expandable fluid cushions.

4,462,950

METHOD OF PRODUCING A TUBULAR ARTICLE HAVING AN ANNULAR GROOVE THEREIN

Claes T. Nilsson, Löddeköpinge; Kjell M. Jakobsen, Skanör, and Lars G. Larson, Höör, all of Sweden, assignors to PLM AB, Malmö, Sweden

Division of Ser. No. 266,849, May 26, 1981, Pat. No. 4,416,927.
This application Sep. 7, 1982, Ser. No. 415,013
Claims priority, application Sweden, May 29, 1980, 8004003
Int. Cl.³ B29C 17/02
U.S. Cl. 264—292 7 Claims



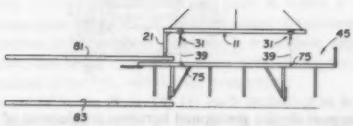
1. A method for producing an article with a peripheral groove comprising providing a tubular blank of essentially amorphous polyethylene terephthalate, applying pressure against the wall of the blank by a mechanical shaping device which is relatively narrow in the axial direction of the blank and contacts the blank peripherally to compress the wall of the blank, applying axial stretching forces to the blank by external devices remote from said mechanical shaping device to axially stress the material in the region in which said pressure is applied by said mechanical shaping device and concurrently therewith, whereby the thickness (d) of the material in said region is reduced to a thickness which corresponds to the thickness obtained when a panel made of said amorphous material having a thickness (a) of said blank is monoaxially drawn until yield occurs at an initial temperature immediately before drawing that is the same as the temperature of the material in the bottom of the groove immediately before yield commences as the groove is formed.

4,462,951

METHOD AND APPARATUS FOR CONSTRUCTING MULTI-STORIED CONCRETE BUILDINGS

Fred E. Martin, 506 Malaga, Apt. #1, Coral Gables, Fla. 33134

Filed Mar. 17, 1983, Ser. No. 476,032
Int. Cl.³ B28B 13/06
U.S. Cl. 264—334 3 Claims



1. A method for extracting, with a crane, form panels used in forming floor slabs on poured-in-place, multi-story concrete structures from beneath the slab last formed on the panels, comprising the steps of:

(a) providing a frame suspended by said crane above the plane of said last formed slab and straddling the periphery of said slab,

(b) providing first means for connecting said frame to said slab,

(c) using said first means to connect said frame to said slab,

(d) providing a plurality of second means for attaching each of said panels to said frame, at least one of said second means movably mounted on said frame,

(e) moving one of said panels partially from beneath said last formed slab and partially below said frame,

(f) using said movably mounted second means to make a first attachment of said one panel to said frame,

(g) moving said one panel further from beneath said last formed slab and concurrently moving said movably mounted second means along said frame so that said first attachment partially supports said one panel,

(h) using at least one other of said second means to make at least a second attachment of said one panel to said frame so that said attachments together support said panel,

(i) disconnecting said frame from said slab, and

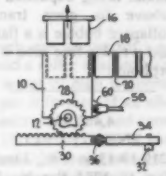
(j) moving said frame away from said slab.

4,462,952

MOLD POSITIONING METHOD AND APPARATUS

Jean-Claude H. Hautemont, Gif-sur-Yvette, France, assignor to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques ERCA, Orsay, France

Filed Nov. 12, 1982, Ser. No. 441,302
Int. Cl.³ B29C 1/00
U.S. Cl. 264—509 11 Claims



1. In a method for molding a container from a preform web wherein a label is first inserted in a mold cavity and then the container is formed in the mold, the improvement comprising:

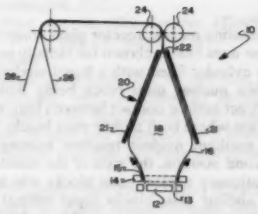
after forming said container in said mold, moving said mold in an axial direction to clear the newly formed container, then pivoting said mold about an axis fixed relative to said mold and extending transversely of said axial direction to a label receiving position, and thereafter pivoting said mold about said fixed axis while moving the mold axially to return said mold in a single compound movement to the position in which said container was formed.

4,462,953

PROCESS FOR THE MANUFACTURE OF POLYESTER FILM

Joseph N. Feil, Akron, and Anthony P. Albert, Canton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 27, 1982, Ser. No. 382,760
Int. Cl.³ B29D 7/06
U.S. Cl. 264—564 4 Claims



1. A process for producing wrinkle-free polyester film, comprising:

continuously melt extruding polyester through an annular

die to form a bubble; wherein said polyester is the reaction product of a dicarboxylic compound and a diol, said dicarboxylic compound is selected from the group consisting of alkyl dicarboxylic acids having from 4 to 12 carbon atoms, aryl or alkyl substituted aryl dicarboxylic acids having from 8 to 16 carbon atoms, alkyl dicarboxylic acids esters having from 6 to 20 carbon atoms and aryl and alkyl substituted aryl dicarboxylic acid esters having from 10 to 20 carbon atoms; and

wherein said diols are selected from the group consisting of alkyl diols having from 2 to 12 carbon atoms;

simultaneously quenching and rapidly expanding said polyester bubble to a substantially larger diameter;

collapsing said bubble through a shroud; wherein said shroud comprises:

a pair of hollow plates which receive said polyester bubble, positioned to form an A-frame having a slit at the apex, said A-frame having an interior angle of between 10° and 70°;

a means for forcing a fluid through a plurality of apertures in said hollow plates;

wherein said fluid provides a low friction cushion for the passage of said bubble across said plates; and

wherein said collapsed bubble passes through said slit;

said polyester bubble being expanded and collapsed at a temperature above its glass transition temperature wherein said collapsed bubble is a flat, wrinkle-free tube, and wherein said wrinkle-free tube is substantially unoriented and amorphous.

4,462,954

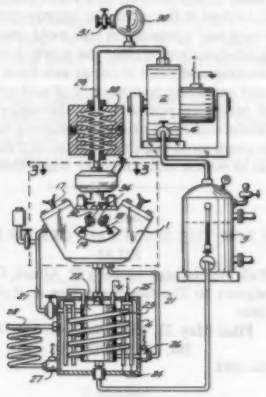
ENERGY CELL

Friedrich Weinert, 219-19-131st Ave., Jamaica, N.Y. 11413

Filed Jan. 11, 1982, Ser. No. 338,276

Int. Cl.³ G21C *7/00*

U.S. Cl. 376—208 **5 Claims**



1. A self pulsating nuclear reactor plant comprising a pair of mobile nuclear mass blocks chosen for radially pendant motion in an arcuate cylinder filled with a liquid moderator, the arch of each mobile nuclear mass block being limited in a first position by direct surface contact between both mass blocks in vertical position where both mobile mass blocks become super critical, the resultant nuclear reaction moving both blocks apart to a second position, the arch of the mobile mass blocks limited by stationary nuclear mass blocks which again makes both sets of nuclear mass blocks super critical whereby the nuclear reaction repulses mobile mass blocks back towards the first position, this motion serving to pump a working fluid through the reactor to drive a liquid turbine or motor to do physical work, collecting high energy charged particles emanating from each nuclear excursion inside a copper primary coil filled with a coolant and directing said changed particles into a secondary coil inside an energy cell whereby secondary coil winds around a cathode through which the working fluid circulates, thus creating a induction current, the reactor comprising:

(A) A pair of mobile nuclear mass blocks situated between a vertical and horizontal position inside an arcuate cylinder,

(B) A pair of stationary nuclear mass blocks limiting the arch of mobile nuclear mass blocks,

(C) A reactor housing in form of an arcuate cylinder with inlet and outlet valves to direct a working fluid through the reactor by the motion introduced by the nuclear reaction of the mobile nuclear mass blocks,

(D) A cooling coil made from copper tubing circulating a coolant which carries radiated energy,

(E) A magnetic filter to remove nuclear particles from the working fluid,

(F) A liquid turbine motor driven by the working fluid accelerated inside the reactor, the motor being connected to a drive means,

(G) A storage tank to store the working fluid,

(H) An energy cell containing a circulation tank of the working fluid whereby the circulation tank acts as a cathode by a positive coil winding around cathode inside an active solution which is stimulated by impulses of electro magnetic forces and chemical interactions,

(I) zinc plates installed around the cathode which interacts galvanically with the copper winding of the coil depending on the frequency of the nuclear impulses inside reactor housing.

4,462,955

SUPPORT DEVICE POSITIONED BETWEEN AN ELEMENT OF LARGE MASS AND A FIXED SUPPORT

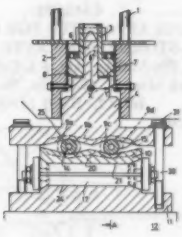
Michel Albin, Vaucresson, and Dominique B. Pillon, Neuilly-Sur-Seine, both of France, assignors to Framatome, Courbevoie, France

Filed Oct. 22, 1981, Ser. No. 313,924

Claims priority, application France, Nov. 14, 1980, 80 24242

Int. Cl.³ G21C *17/00*; E02D *27/34*

U.S. Cl. 376—272 **4 Claims**



1. Support device positioned between an element of predetermined mass (1) and a fixed support (12), enabling limitation of displacements and accelerations of said element with respect to said support upon movements caused by severe stresses, said device comprising

(a) cylindrical rollers (14, 15, 17, 18) arranged horizontally in two superposed sets of at least two parallel rollers, the rollers of one set (14, 15) having their axes perpendicular to the axes of the rollers of the other set (17, 18); and

(b) a set of three superposed support elements totally independent of one another and having on their facing sides roller tracks (9, 20, 21, 24) inclined to the horizontal, the rollers (14, 15) of said one set being arranged between the uppermost (4) of said support elements carrying said element of large mass (1) and the intermediate one (10) of said three support elements in contact with said roller tracks

(9, 20); the rollers (17, 18) of said other set between said intermediate support element (10) the lowermost (11) of said support elements resting on said fixed support (12), in contact with said roller tracks (21, 24) provided on said elements;

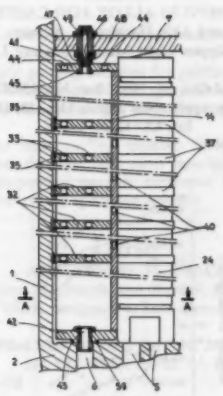
(c) each of said rollers (14, 15, 17, 18) comprising in axial direction a central portion of revolution (15*a*) and two end portions of revolution (15*b*, 15*c*) flared outwardly inclined at an acute angle to the horizontal plane, said roller tracks (9, 20, 21, 24) having profiles corresponding to those of said rollers in the longitudinal direction of the latter.

4,462,956

APPARATUS FOR PARTITIONING OFF THE CORE OF A NUCLEAR REACTOR WITH REMOVABLE ELEMENTS

Pierre Boiron, Sceaux, and Pierre Poitrenaud, Elancourt, both of France, assignors to Framatome, Courbevoie, France

Filed Apr. 8, 1981, Ser. No. 251,836
Claims priority, application France, Apr. 25, 1980, 80 09309
Int. Cl.³ G21C *11/00*
U.S. Cl. 376—287 9 Claims



1. A device for partitioning off the core of a pressurized nuclear water reactor, said reactor core being constituted by prismatic assemblies juxtaposed inside a core casing laterally bounding a space surrounding said core in which a cooling liquid circulates in the longitudinal direction of said assemblies, a transverse lower support plate and a transverse upper support plate also being disposed at either side of said core in the longitudinal direction, said device comprising

(a) a set of boxes (8, 9, 10, 11) each including at least two plates (12–13, 14–15, 27–29, 28–30) rigidly assembled at right angles and disposed in the longitudinal direction of said assemblies (24); and

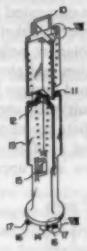
(b) a plurality of transverse plates (32) perpendicular to said longitudinal plates and rigidly assembled to the latter, each of said boxes (8, 9, 10, 11) being removably disposed side by side inside the core casing (1) and bearing on said core casing without being attached thereto, so that the faces of said longitudinal plates directed towards the reactor core serve as bearing faces for said assemblies (24) disposed at the periphery of said core, each of said boxes (8, 9, 10, 11) being intercalated between said lower support plate (2) and said upper support plate (7) and fixed at its upper ends to said upper support plate by a flexible coupling (46, 47, 48) allowing each of said boxes to be displaced longitudinally.

4,462,957

SLIDING MECHANISM

Yutaka Fukui; Yoshimitsu Tobita; Fumio Hataya; Mitsuhiro Watanabe, and Noriaki Mase, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,333
Claims priority, application Japan, Jul. 9, 1980, 55-92735
Int. Cl.³ G21C *7/10*
U.S. Cl. 376—327 5 Claims



5. Control rod guide mechanism for a nuclear reactor comprising a fixed pin and a roller adapted to rotate about the axis of said pin in pure water of high temperature and high pressure, wherein said pin is formed of an alloy having predominantly an austenite microstructure and consisting essentially of, by weight, 0.05–0.15 carbon, 7–12% nickel, 16–22% chromium, 2–6% silicon, 4–10% manganese, less than 0.08% nitrogen and the balance essentially iron, said alloy having been subjected to cold plastic working with a reduction in area of 5–40%, and wherein said roller is formed of a casting of an alloy having a γ' phase precipitated in an austenite phase matrix and consisting essentially of, by weight, 0.05–0.2% carbon, 0.1–1% silicon, 0.1–1% manganese, 15–20% chromium, 4–8% molybdenum, 0.3–3% titanium, 3–8% aluminum, titanium and aluminum being 3.3–8.3% in total, and the balance essentially nickel, said roller having a Vickers hardness higher by 0–200 than that of said pin at their sliding contact surfaces, said pin having been subjected to cold plastic working to provide the surface contacting the surface of the roller with a Vickers hardness of more than 300 and the roller having been subjected to solution heat treatment to cause precipitation of a γ' phase to occur and then to an aging treatment to provide a γ' phase precipitated in fine grain size therein and to exhibit a higher hardness than said pin.

4,462,958

LMFBR FUEL ASSEMBLY DESIGN FOR HCDA FUEL DISPERSAL

Robert E. Lacko, North Huntingdon, and Roger W. Tilbrook, Monroeville, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 30, 1982, Ser. No. 373,469
Int. Cl.³ G21C *3/28*
U.S. Cl. 376—420 3 Claims

1. A fuel assembly arrangement for use with a liquid metal fast breeder reactor, said fuel assembly arrangement being operable to reduce the tendency to form blockages in the upper portions of said fuel assembly in a hypothetical core disruptive accident, said fuel assembly arrangement comprising:

an array of elongated fuel rods retained in parallel and vertical orientation, spacer means between said fuel rods for maintaining therebetween a closely spaced relationship, a vertically disposed duct member surrounding said fuel rods and forming a confined path for liquid metal coolant flow upwardly through said duct member and between said closely spaced fuel rods;

said elongated fuel rods being of a first design and a second different design, each of said fuel rod designs including an elongated surrounding cladding member having fertile material formed as lower blanket pellets disposed at a lower portion of said cladding member, and fissile fuel formed as pellets positioned above said lower blanket pellets;

the first of said fuel rod designs having a relatively short fission gas plenum positioned above said fission fuel pellets, upper blanket pellets positioned above said short fission gas plenum, an elongated fission gas plenum positioned above said upper blanket pellets, and means for retaining said upper blanket pellets and said fission fuel pellets in position within said elongated cladding;

the second of said fuel rod designs having a relatively long fission gas plenum positioned above said fission fuel pellets, upper blanket pellets positioned above said elongated fission gas plenum, and a relatively short fission gas plenum positioned above said upper blanket pellets, and

means for retaining said upper blanket pellets and said fission fuel pellets in position within said elongated cladding;

the positioning of said upper blanket pellets in said first fuel rod design and the positioning of said upper blanket pellets in said second fuel rod design bearing such relationship that all portions of said upper blanket pellets in said first fuel rod design are positioned substantially beneath all portions of said upper blanket pellets in said second fuel rod design; and

said fuel rods as retained in said duct being arranged so that fuel rods of said second design are positioned about the central portion of said duct, and said fuel rods of said first design are positioned peripherally about said fuel rods of said second design; whereby a hypothetical core disruptive accident which results in blockage proximate said upper blanket portions of said fuel rods of said second design will cause coolant metal to flow through the upper portion of said surrounding fuel rods of said first design.

4,462,959

HGCDTE BULK DOPING TECHNIQUE

John H. Tregilgas, Richardson, Tex., assignor to Texas Instruments, Dallas, Tex.

Filed Apr. 5, 1982, Ser. No. 365,135
Int. Cl.³ H01L *3/20*
U.S. Cl. 420—525 **18 Claims**

1. A method for providing bulk HgCdTe having a desired concentration of a selected dopant, comprising the steps of:

providing pure liquid mercury;

dissolving said desired dopant in mercury to achieve a concentration of said dopant in said mercury, said final concentration of said dopant in said mercury corresponding to said desired concentration of said dopant in HgCdTe; and

compounding said mercury including said final concentration of said dopant, with cadmium and tellurium, whereby HgCdTe having said desired concentration of said dopant uniformly distributed throughout is formed.

4,462,960

ZINC ANODE ALLOY FOR SACRIFICIAL ANODES

Torleif N. Jore, Slemmestad, Norway, assignor to Norzink A/S, Odda, Norway

Filed Dec. 27, 1982, Ser. No. 453,152
Claims priority, application Norway, Dec. 28, 1981, 814438
Int. Cl.³ C22C *18/00*
U.S. Cl. 420—519 **3 Claims**

1. A zinc anode alloy for sacrificial anodes consisting essentially of

0.01–1.0% by weight magnesium

0.10–0.50% by weight of aluminium

0.025–0.15% by weight of cadmium

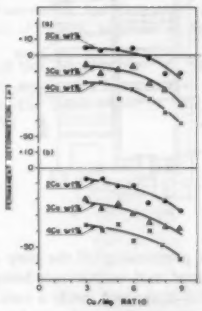
and the remainder zinc and impurities caused by the production method.

4,462,961

ALUMINUM ALLOY FOR CASTING

Tadao Ito, Fuji, and Akio Hashimoto, Numazu, both of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,670
Claims priority, application Japan, Oct. 28, 1981, 56-171507
Int. Cl.³ C22C *21/02*
U.S. Cl. 420—534 **4 Claims**



1. An aluminum alloy for casting purposes which consists essentially of over 6% and up to 13% by weight of silicon, over 2% and up to 5% by weight of copper, over 0.25% and up to 1% by weight of magnesium, over 0.1% and up to 0.5% by weight of nickel and over 0.03% and up to 1% by weight of antimony, the balance being aluminum and impurities, said copper and said magnesium having a ratio by weight of about 3:1 to 8:1.

4,462,962

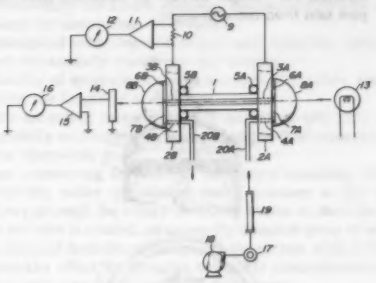
LIQUID CHROMATOGRAPHIC FLOW CELL

Nobuyuki Baba, Atsugi, and Kelichi Housako, Sagamihara, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jul. 11, 1983, Ser. No. 512,678
Claims priority, application Japan, Jul. 19, 1982, 57-108186[U]
Int. Cl.³ B01D *15/08*
U.S. Cl. 422—58 **7 Claims**

1. A liquid chromatographic flow cell for measuring constituents of a specimen solution, comprising:

(a) at least two electrodes, each having a first through hole;
(b) an insulating member having a second through hole and so disposed as to electrically insulate said at least two electrodes from each other;
(c) a first and a second supporting members for clamping therebetween said at least two electrodes and said insulating member in such a way that said first through holes and said second through holes are coaxially aligned so as to define a first passage of said specimen solution and having, respectively, a second passage and a third passage of said



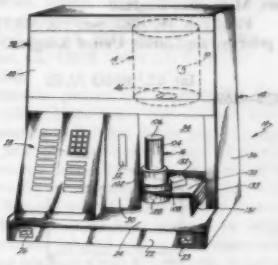
specimen solution which communicate with said first passage;
(d) a first light guiding member for guiding a light for measuring an absorbance of said specimen solution into said second passage defined in said first supporting member; and
(e) a second light guiding member for guiding the light transmitted through said third passage defined in said second supporting member to means for measuring an absorbance of said specimen solution.

4,462,963

ANALYTICAL FURNACE

Larry S. O'Brien, St. Joseph, and Ward S. Kaler, Benton Harbor, both of Mich., assignors to Leco Corporation, St. Joseph, Mich.

Filed Mar. 5, 1982, Ser. No. 355,213
Int. Cl.³ G01N *25/02, 31/12*
U.S. Cl. 422—78 **1 Claim**



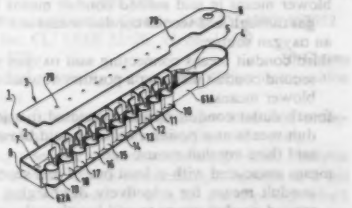
1. An analytical furnace comprising:
a housing;
a furnace enclosure supported by said housing and defining a furnace chamber, said furnace enclosure including a lower portion having an aperture communicating with said chamber;
platform means supported by said housing for supporting samples to be analyzed;
means for moving said platform between a raised, analyzing position, wherein said platform extends through said aperture and is located within said furnace chamber, and a lowered position in which said platform and any samples supported thereon are located below said furnace enclosure;
means for permitting movement of said platform between said lowered position and a remote loading position, wherein said platform is located out of vertical alignment with said furnace chamber to facilitate loading and unloading of samples on said platform;
means for restricting horizontal movement of said platform between said loading and lowered positions and for restricting vertical movement of said platform between said lowered and analyzing positions, said restricting means, comprising means defining a groove in said housing, said restricting means further comprising a follower extending from said platform means into said groove whereby said follower can move only within said groove;
a generally U-shaped heating element extending downwardly through said furnace enclosure into said furnace chamber and including a pair of elongated spaced legs joined at one end;
said furnace enclosure including a first insulating member defining a first elongated slot through which said spaced legs extend into said chamber; and
said furnace enclosure further including a second insulating member overlying said first insulating member and defining second and third elongated slots through which said spaced legs extend, neither of said second or third elongated slot being linearly aligned with said first elongated slot to reduce air flow through said insulating members along and about said spaced legs.

4,462,964

CONDITIONING DEVICE FOR PREPARING MULTIPLE ANALYSES

Jean Guigan, 9 rue Jean Mermoz, 75008 Paris, France

Filed Jan. 11, 1983, Ser. No. 457,317
Claims priority, application France, Jan. 14, 1982, 82 00529
Int. Cl.³ G01N *21/07, 1/10, 33/50*; B04B *11/00*
U.S. Cl. 422—102 **9 Claims**



1. A conditioning device for preparing multiple analyses of an initial liquid sample to be analysed, said device comprising a receptacle, means communicating said receptacle with n calibrated analysis cells in which analysis reagents are inserted, the liquid to be analysed being conveyed from the receptacle to said analysis cells by centrifuging, each of the cells being provided with a capillary liquid-insertion orifice and an air exhaust capillary pipe, the improvement wherein; said device is in the form of a strip unit, said unit including a first end which carries said receptacle, and wherein said communication means includes a first tank which communicates firstly with the first analysis cell via the first capillary liquid-insertion orifice and secondly with a second tank which communicates firstly with a second analysis cell via the second capillary liquid-insertion orifice and secondly with a third tank and so on, the n^{th} tank which is in communication with the $(n-1)^{th}$ tank communicating with the n^{th} analysis cell via the n^{th} capillary liquid-insertion orifice and with an overflow cell located near the second end of the strip unit, the volumes of the tanks being slightly greater than the volumes of the analysis cells to which they are respectively associated, the analysis cells as

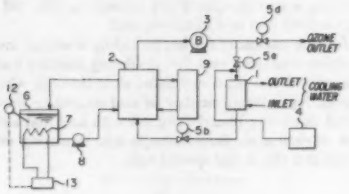
well as the tanks being substantially aligned along the strip unit, the communication means between the tanks further including means for ensuring successive and not simultaneous filling thereof, said conditioning device being suitable for fixing on a rotary circular plate which forms a rotor and being placed along a radius of said plate, the strip unit end which is fitted with the receptacle being located near the center of the plate, the end which is fitted with the overflow chamber being situated near the periphery of the plate.

4,462,965

INTERMITTENT OZONIZING APPARATUS

Kenkoku Azuma; Isao Kajita, and Akaru Usui, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,644
Claims priority, application Japan, Jun. 5, 1981, 56-86691
Int. Cl.³ C01B *13/00*
U.S. Cl. 422—186.08 **9 Claims**



1. An intermittent ozonizing apparatus comprising:
an adsorption-desorption tower;
an ozonizer;
first conduit means connecting said ozonizer to one end of said adsorption-desorption tower;
second recycling conduit means connecting another end of said adsorption-desorption tower to said ozonizer;
blower means in said second conduit means for blowing a gas through said second conduit means in a flow direction;
an oxygen source;
third conduit means connecting said oxygen source to said second conduit means at a position downstream from said blower means;
fourth outlet conduit means connected to said second conduit means at a position between said blower means and said third conduit means; and
means associated with at least one of said second and fourth conduit means for selectively discharging a gas in said second conduit means to said fourth outlet conduit means,
whereby oxygen from said oxygen source is ozonated in said ozoner and said ozonizer is adsorbed at a reduced pressure in said adsorption-desorption tower, and whereby desorbed ozone from said adsorption-desorption tower can be discharged to said fourth outlet conduit means by said blower means.

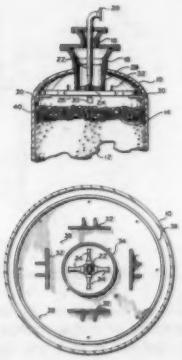
4,462,966

FLUID DISTRIBUTOR MEANS

Peter C. Stynes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 13, 1982, Ser. No. 377,748
Int. Cl.³ B01J *8/02*; B01D *25/30, 29/42, 57/00*
U.S. Cl. 422—220 **15 Claims**

1. Fluid distributor means, for disassociating components of and distributing a fluid on the surface of a confined body of material, comprising:
(a) vessel means containing said confined body of material;
(b) vertically-disposed, tubular fluid inlet means disposed above said surface of the body of material and terminating at its lower end in a plurality of generally, radially-disposed tubes having their peripheral ends open for the discharge of said fluid;
(c) annular tray means mounted between said radially-disposed tubes and said surface of the body of material, having a generally-flat bottom extending from a point adjacent to, but spaced from, the peripheral ends of said radially disposed tubes to a point adjacent the outer periphery of said surface of the body of material;
(d) said tray means having a plurality of passages formed through the bottom thereof of sufficient dimensions to pass said fluid therethrough;



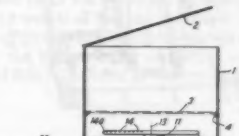
(e) said tray means also having fluid impervious, upstanding inner and outer edges of sufficient height to prevent overflow of said fluid disposed thereon at the inner and outer edges of said tray means; and
(f) a plurality of upstanding baffle means, equal in number to the number of radially-disposed tubes, mounted on top of the tray means and having a height and being positioned on said tray means so as to intercept and disassociate components of said fluid issuing from said peripheral ends of said radially-disposed tubes.

4,462,967

POWDER DISPENSER

Rudolph Berelson, Treelawns, 34 Fallowfield, Stanmore Hill, Stanmore, Middlesex, England

Filed Feb. 16, 1982, Ser. No. 348,712
Claims priority, application United Kingdom, Feb. 13, 1981, 8104483
Int. Cl.³ B01D *11/02*
U.S. Cl. 422—269 **8 Claims**



1. A dishwashing apparatus including a powder dispenser in which dishwashing powder and water are mixed and pumped to a main dishholding compartment of a dishwasher in which dishes are to be cleansed, said apparatus comprising:
a housing defining a main dishholding compartment of a dishwasher;

a powder dispenser means including a container for holding powder having an inlet and an outlet;

means connecting said outlet for removal of a uniformly concentrated solution of dishwasher powder and water and transferring said uniformly concentrated solution from said container to the main dishholding compartment of the dishwasher for the cleansing of dishes in the dishwasher;

means connecting a source of water under pressure to the inlet of the container;

a substantially flat screen spanning the interior of said container for supporting the powder;

an elongated tube disposed within said container, beneath and substantially parallel to said screen;

a plurality of apertures directed towards said screen, spaced along the length of said tube;

rotary mounting means rotatably mounting said tube substantially mid-length of said tube and in fluid communication therewith; and

means connecting the inlet to the rotary mounting means whereby water introduced under pressure at the inlet flows through the rotary mounting means to the tube and as the tube is rotated, an upwardly directed spray of water is directed from the tube through the screen, with a rotary sprinkler effect, to form the uniformly concentrated solution with powder retained on the screen.

4,462,968

FINISHING PROCESS FOR THE REMOVAL OF SULFUR COMPOUNDS FROM A GAS STREAM

James J. Tazuma, Stow, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 23, 1982, Ser. No. 410,186
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—224 **2 Claims**

1. A process for removing mercaptans, sulfides and disulfides from a natural gas stream that consists of contacting said natural gas stream with a solution consisting of (a) 1 to 25% hydrogen peroxide by weight (b) 1 to 15% by weight sodium carbonate or sodium hydroxide and (c) 1% by weight to saturation of ammonia.

4,462,969

REGENERATION OF SULFUR DIOXIDE SCRUBBER LIQUOR

James H. Wilhelm, Sandy, Utah, assignor to Central Illinois Public Service Company, Springfield, Ill.

Filed Jun. 10, 1983, Ser. No. 503,040
Int. Cl.³ C01B *17/00, 17/45, 17/62*
U.S. Cl. 423—242 **5 Claims**

1. The continuous process for regenerating spent sulfur dioxide gas scrubber bleed liquor that contains $NaHSO_3$ and Na_2SO_3, by reacting said bleed liquor with a calcium compound which process comprises the steps of providing said calcium as a calcium carbonate slurry, establishing and maintaining respectively in serially connected first and second reaction zones first and second sludge blankets each containing from about fifteen to about forty percent by weight solids overlain respectively by first and second supernatant liquor pools containing less than about two percent by weight solids, subjecting said sludge blankets to gentle agitation to effect mixing of the sludge, continuously introducing said calcium carbonate slurry into an upper portion of said first sludge blanket below said first supernatant pool while continuously introducing into submergence in a lower portion of said first sludge blanket a stream of said scrubber bleed liquor, withdrawing supernatant liquor from said first supernatant pool and introducing it into submergence in the lower portion of said second sludge blanket, withdrawing sludge from said first sludge blanket and introducing the same into an upper portion of said second sludge blanket, and withdrawing regenerated scrubbing liquid from said second supernatant pool and solids from said second sludge blanket in amounts proportional respectively to the amounts of bleed liquor and limetone supplied to said reaction zones.

4,462,970

PROCESS FOR PREPARATION OF WATER-FREE OXYCHLORIDE MATERIAL

Ricardo C. Pastor, Manhattan Beach; Antonio C. Pastor, Santa Monica; Luisa E. Gorre, Oxnard, and Remedios K. Chew, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 294,581, Aug. 19, 1981. This application Apr. 4, 1983, Ser. No. 481,594
Int. Cl.³ C01F *17/00*
U.S. Cl. 423—263 **2 Claims**

1. A process for the preparation of a water-free rare earth oxychloride powder from a water-containing rare earth oxide powder comprising the step of exposing said water-containing rare earth oxide powder to a gas phase reactive atmosphere comprising chlorine and oxygen at 1000° C. for 24 hours to produce a chemical reaction with and removal of water and water-derived impurities in said oxide powder and to simultaneously convert said rare earth oxide powder to said rare earth oxychloride powder.

4,462,971

PREPARATION OF CRYSTALLINE METAL SILICATE AND BOROSILICATE COMPOSITIONS

James A. Hinnenkamp, and Vernon V. Walatka, Jr., both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 256,304, Apr. 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 92,127, Nov. 7, 1979, Pat. No. 4,331,641. This application Dec. 29, 1982, Ser. No. 454,132
Claims priority, application Canada, Oct. 23, 1980, 363052
Int. Cl.³ C01B *33/20, 33/26, 35/10*
U.S. Cl. 423—277 **10 Claims**

1. A method of preparing a crystalline silicate composition which comprises:

(a) preparing a first mixture comprising a tetraalkyl ammonium salt, alkali metal hydroxide, silica and water,

(b) preparing a second mixture comprising water, a soluble source of a metal whose hydroxide precipitates at a pH above 7 and an amount of urea or a compound which upon hydrolysis releases ammonia, said amount effective to precipitate the hydroxide of said metal,

(c) admixing an amount of said first mixture and an amount of said second mixture effective to provide a reaction mixture having an aluminum content of less than about 100 wppm (based on silica) and having a composition in terms of mole ratios of oxides, falling within the following ranges:

OH^-/SiO_2	0.05–3
$Q^+/(Q^+ + A^+)$	0.01–1
H_2O/OH^-	10–800
$SiO_2/M_{2/m}O$	10–10,000

wherein Q^+ is tetralkyl ammonium ion, A^+ is alkali metal ion, M is said metal and m is the valence of said metal, whereby the hydroxide of said metal forms a precipitate,

(d) maintaining the reaction mixture at a temperature of about 50° to about 250° C. until crystals of metal silicate are formed and

(e) separating and recovering said crystals.

4,462,972
METHOD FOR PRODUCING FERTILIZER-GRADE PHOSPHORIC ACID

William A. Satterwhite, Mulberry, Fla., assignor to CF Industries, Inc., Long Grove, Ill.

Filed Jul. 19, 1982, Ser. No. 399,834
Int. Cl.³ C01B 25/16
U.S. Cl. 423—320 10 Claims

1. In a process for producing fertilizer-grade phosphoric acid, said process including continuously combining phosphate rock and water neutralized with ammonia to produce a stream of phosphate rock slurry, continuously adding to said rock slurry stream a predetermined, adjustable rate of sulfuric acid to produce a reaction mixture including phosphoric acid, ammonium ion and sulfate ion, wherein the improvement comprises: approximately simultaneously obtaining over a plurality of preselected time intervals at least three samples of said mixture for testing; quantitatively testing subsequent to each one of said plurality of time intervals a first one of said three samples to determine amount of ammonium ion present in said mixture; quantitatively testing subsequent to each one of said plurality of time intervals a second one of said three samples to determine amount of phosphoric acid present in said mixture; quantitatively testing subsequent to each one of said plurality of time intervals a third one of said three samples to determine amount of sulfate ion present in said mixture; and continuously adjusting said sulfuric acid rate in response to said ammonium ion amount, said phosphoric acid amount and said sulfate ion amount thus determined subsequent to each said one of said plurality of time intervals for continuously maintaining in said mixture a predetermined excess amount of sulfate ion and wherein said ammonium ion amount, said phosphoric acid amount and said sulfate ion amount determined subsequent to each said one of said plurality of time intervals are used for approximately determining a theoretical sulfate ion demand present in said mixture at each said one of said plurality of time intervals; and wherein said predetermined sulfate ion excess amount ranges from about 1% to about 2% more than said theoretical sulfate ion demand.

4,462,973
PHOSPHORUS PURIFICATION

David A. Crea, and Jerry A. Keely, both of Pocatello, Id., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 27, 1983, Ser. No. 508,211
Int. Cl.³ C01B 25/01, 25/02, 25/04
U.S. Cl. 423—322 17 Claims

1. A method for refining yellow phosphorus existing as a mass of liquid yellow phosphorus in a continuous phase and containing sufficient color-causing impurities to impart to the phosphorus a black color by reflected light which comprises forming an intimate mixture of at least a portion of the mass with water to provide a volume ratio of the portion of the mass to water of from about 2:1 to about 100:1, subjecting the mixture to intense agitation whereby impurities migrate from the phosphorus to the phosphorus-water interface and thereafter separating refined yellow phosphorus from the aqueous phase containing the impurities.

4,462,974
PROCESS FOR PREPARATION OF WATER-FREE OXIDE MATERIAL

Ricardo C. Pastor, Manhattan Beach; Antonio C. Pastor, Santa Monica; Luisa E. Gorre, Oxnard, and Remedios K. Chew, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 294,581, Aug. 19, 1981. This application Apr. 4, 1983, Ser. No. 481,591
Int. Cl.³ C01B 33/18; C01G 17/02, 23/047, 25/02
U.S. Cl. 423—335 3 Claims

1. A process for the preparation of a water-free oxide of an element selected from the group consisting of silicon, germanium, titanium and zirconium, comprising the steps of:

(a) providing a starting material comprising an alkoxy compound of said element containing a multiplicity of first oxygen-containing groups bonded to a single atom of said element through atoms of said oxygen;

(b) providing trifluoroacetic anhydride, which is capable of reacting with said starting material to replace said first oxygen-containing groups with second oxygen-containing groups derived from said anhydride, to form an unstable intermediate product which can be subsequently decomposed; and

(c) reacting said starting material with said anhydride to form said intermediate product and then decomposing said intermediate product by heating, to form said oxide and to simultaneously regenerate said trifluoroacetic anhydride, whereby said regenerated anhydride reacts with and removes traces of water and water-derived impurities during the formation of said oxide, to thereby provide said water-free oxide.

4,462,975
SYNTHESIS OF PENTAFLUOROTELLURIUM HYPOFLUORITE

Carl J. Schack, Chatsworth; William W. Wilson, Simi Valley, and Karl O. Christe, Calabasas, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

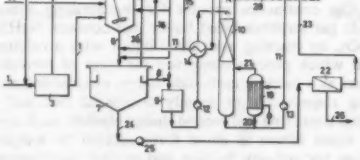
Filed Mar. 24, 1983, Ser. No. 478,581
Int. Cl.³ C01B 11/24
U.S. Cl. 423—473 4 Claims

1. The compound pentafluorotellurium hypofluorite.

4,462,976
METHOD FOR THE TREATMENT OF CHLORIDE-CONTAINING WASTE WATERS

Robert Karger, Dortmund, Fed. Rep. of Germany, assignor to Vereinigte Elektrizitätswerke Westfalen AG, Dortmund, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,857
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108444
Int. Cl.³ C01B 7/03; C01F 11/46
U.S. Cl. 423—481 13 Claims



1. A method for the treatment of waste water containing calcium chloride, comprising adding sulfuric acid to the waste water in a reaction vessel to produce hydrochloric acid and gypsum and circulating the mixture in a closed cycle between a reaction vessel and a distilling column having an intensifier section for the extractive distillation of the resulting hydrochloric acid, and filtering out the accumulating gypsum sludge from the treated waste water, wherein the added amount of waste water and amount of hydrochloric acid correspond to the amount of sludge exiting the reaction vessel or the amount of distillate removed from the distilling column and the amount

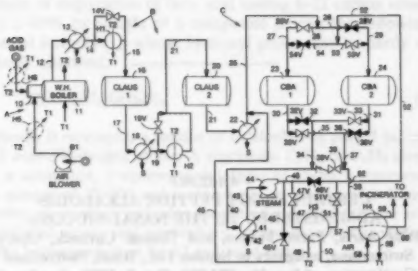
of gypsum separated, and the hydrochloric acid concentration in the liquid is less that the maximum azeotropic concentration for a mixture of H_2O and HCl.

4,462,977

RECOVERY OF ELEMENTAL SULFUR FROM SOUR GAS

Robert L. Reed, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 26, 1982, Ser. No. 371,889
Int. Cl.³ C01B 17/04; B01J 8/04
U.S. Cl. 423—574 R 27 Claims



1. Process comprising:

(a) combusting a gas stream containing hydrogen sulfide in the presence of oxygen in a thermal reaction zone to produce hot combustion gases containing hydrogen sulfide, sulfur dioxide, and free sulfur;

(b) reacting at least a portion of the sulfur dioxide and hydrogen sulfide in the hot combustion gases in a catalytic reaction zone to produce additional free sulfur, the catalytic reaction zone comprising at least one catalytic reactor operated at a temperature effective to adsorb a preponderance of the thus produced free sulfur on catalyst therein and to produce a lean effluent stream;

(c) heating a cool gas stream to a temperature effective for removal of adsorbed free sulfur from the catalyst of the at least one catalytic reactor in indirect heat exchange relation via a heat transfer medium with the hot combustion gases to produce a hot regeneration stream;

(d) removing adsorbed free sulfur from the catalyst of the at least one catalytic reactor by passing the hot regeneration stream in contact therewith to produce a regeneration stream laden with free sulfur; and

(e) cooling the hot regeneration stream laden with free sulfur and condensing free sulfur therefrom.

4,462,978

PREPARATION OF HYDROGEN PEROXIDE

William F. Brill, Skillman, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,566
Int. Cl.³ C01B 15/02
U.S. Cl. 423—584 10 Claims

1. A process for producing hydrogen peroxide by reacting carbon monoxide, oxygen, and water in the presence of a Group 8 noble metal catalyst wherein the improvement comprises carrying out said reaction at temperatures in the range of −78° to +150° C. in a working solution consisting essentially of water and at least one organic solvent selected from the group consisting of carbonyl compounds and nitriles.

4,462,979

PROCESS FOR PREPARING SOFT TiO_2 AGGLOMERATES

William E. Stevens, Newark, Del.; Joel B. Hill, Jr., Eva, Tenn., and Reg Davies, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1982, Ser. No. 352,075
Int. Cl.³ C01G 23/07
U.S. Cl. 423—613 3 Claims

1. In a process for preparing pigmentary TiO_2 by vapor phase oxidation of $TiCl_4$ in the reaction chamber at temperatures above 900° C. wherein a gaseous effluent product stream is removed from the reaction chamber via a flue, where the reaction products are cooled, the improvement comprising removing the product stream first through a flue of a configuration comprising a first section connected to the reaction chamber wherein the flow of the reaction products are conveyed through said first section where the temperature of the gaseous stream is 1100°–1900° K. when the TiO_2 particles are sticky and tend to form hard agglomerates of TiO_2 in a turbulent manner at a velocity as defined by a Reynolds number of from 50,000–1,000,000 then through a second section where the temperature of the gaseous stream is 1000°–1650° K. with a decreased cross-sectional area that results in an increase in the turbulence and an increased velocity as defined by a Reynolds number of from 75,000–1,600,000 when the pigmentary particles of TiO_2 are less sticky and tend to form soft agglomerates, the resulting TiO_2 agglomerates having an improved filtration rate relative to TiO_2 agglomerates produced in a flue without said second section and being easily deagglomerated to pigmentary size.

4,462,980

STABILIZED PLASMIN COMPOSITIONS AND METHOD FOR PREPARATION THEREOF

Allan Diedrichsen, Rodovre; Marie Johannessen, Birkerod, and Peter Tang, Tåstrup, all of Denmark, assignors to Novo Industri A/S, Denmark

Filed Jan. 4, 1982, Ser. No. 336,788
Claims priority, application United Kingdom, Jan. 5, 1981, 8100133
Int. Cl.³ A61K 43/00, 49/02
U.S. Cl. 424—1.1 12 Claims

1. A solid form plasmin composition adapted for labelling with technetium-99m by being admixed with a pertechnetate reducing agent, which composition comprises plasmin, a pertechnetate reducing agent and an effective amount of a plasmin stabilizing polyhydroxy compound selected from the group consisting of the pentitols xylitol and ribitol, meso-inositol, the monosaccharides glucose, mannose, galactose, fructose, and sorbose and the disaccharides sucrose and maltose.

4,462,981

COSMETIC APPLICATOR USEFUL FOR SKIN MOISTURIZING AND DEODORIZING

James A. Smith, Old Tappan, N.J., assignor to Creative Products Resource, Associates Ltd., Fort Lee, N.J.

Filed Dec. 10, 1982, Ser. No. 448,806
Int. Cl.³ A47K 7/02, 7/03; B32B 5/18
U.S. Cl. 424—27 19 Claims

1. A substantially dry cosmetic applicator comprising a porous sheet impregnated and overcoated with a composition comprising at least one emollient, particles of at least one water-insoluble oil absorbent agent, particles of at least one water-insoluble moisture absorbent agent, at least one deodorizing agent, and fragrance, whereby when the applicator is contacted with a wet skin surface under conditions of pressure, a portion of the emollients and the deodorizing agents are solubilized and released from the sheet so as to soften and deodorize the skin surface and a portion of the absorbent particles are released and coated onto the skin surface so as to de-oil the skin and absorb excess moisture.

4,462,982

MICROCAPSULES AND METHOD OF PREPARING SAME

Masayoshi Samejima, Minoh; Goichi Hirata, Yawata; Yoshiyuki Koida, Katano; Yoshinori Kobayashi, Toyonaka, and Akira Kida, Settsu, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Sep. 17, 1982, Ser. No. 419,695

Claims priority, application Japan, Oct. 5, 1981, 56-159285

Int. Cl.³ B01J *13/02;* **A61K** *9/50, 9/62*

U.S. Cl. 424—35 **17 Claims**

1. In ethylcellulose microcapsules comprising (i) particles of a core material and (ii) ethylcellulose coating walls deposited on and around said particles of the core material, the improvement wherein a polymer material which shows at least 1.2 times increase in weight by immersing it in water at 37° C. is incorporated into the ethylcellulose coating walls and/or the core material of the microcapsules, said polymer material being taken from the class consisting of agar, hydroxypropylcellulose having a hydroxypropoxy content of 2–7 w/w %, free carboxymethylcellulose or its alkaline earth metal salt, starch.acrylic acid graft copolymer or its alkali metal salt, starch.acrylonitrile graft copolymer, cellulose.acrylic acid graft copolymer or its alkali metal salt, cellulose.acrylonitrile graft copolymer, polyvinylalcohol.acrylic acid graft copolymer or its alkali metal salt, epichlorohydrin cross-linked dextrin, epichlorohydrin cross-linked gum arabic, epichlorohydrin cross-linked dextran, epichlorohydrin cross-linked polyvinylalcohol, formaldehyde cross-linked gelatin, acrylic acid cross-linked polyacrylic acid, divinylbenzene acrylic acid copolymer or its alkali metal salt, divinylbenzene methacrylic acid copolymer or its alkali metal salt and divinylbenzene styrenesulfonic acid copolymer or its alkali metal salt.

6. A process for preparing ethylcellulose microcapsules, which comprises the steps of:

(i) dissolving ethylcellulose in cyclohexane to form a solution,

(ii) dispersing particles of a core material in said solution,

(iii) cooling the dispersion in the presence of a polymer material until ethylcellulose separates out from the dispersion to form coating walls on and around the particles of the core material, said polymer material showing at least 1.2 times increase in weight when immersed in water at 37° C. and being selected from the class consisting of agar, hydroxypropyl-cellulose having a hydroxypropoxy content of 2–7 w/w %, free carboxymethylcellulose or its alkaline earth metal salt, starch.acrylic acid graft copolymer or its alkali metal salt, starch.acrylonitrile graft copolymer, cellulose.acrylic acid graft copolymer or its alkali metal salt, cellulose.acrylonitrile graft copolymer, polyvinylalcohol.acrylic acid graft copolymer or its alkali metal salt, epichlorohydrin cross-linked dextrin, epichlorohydrin cross-linked gum arabic, epichlorohydrin cross-linked dextran, epichlorohydrin cross-linked polyvinylalcohol, formaldehyde cross-linked gelatin, acrylic acid-cross-linked polyacrylic acid, divinylbenzene.acrylic acid copolymer or its alkali metal salt, divinylbenzene methacrylic acid copolymer or its alkali metal salt, and divinylbenzene.styrenesulfonic acid copolymer or its alkali metal salt, and

(iv) recovering the resultant microcapsules therefrom.

11. A process for preparing ethylcellulose microcapsules, which comprises the steps of:

(i) dissolving ethylcellulose in cyclohexane to form a solution,

(ii) dispersing particles of a polymer material-containing core material in said solution, said polymer material showing at least 1.2 times increase in weight when immersed in water at 37° C. and being selected from the class consisting of agar, hydroxypropylcellulose having a hydroxypropoxy content of 2–7 w/w %, free carboxymethylcellulose or its alkaline earth metal salt, starch.acrylic acid graft copolymer or its alkali metal salt, starch-acrylonitrile graft copolymer, cellulose.acrylic acid graft copolymer or its alkali metal salt, cellulose.acrylonitrile graft copolymer, polyvinylalcohol.acrylic acid graft copolymer or its alkali metal salt, epichlorohydrin cross-linked dextrin, epichlorohydrin cross-linked gum arabic, epichlorohydrin cross-linked dextran, epichlorohydrin cross-linked polyvinylalcohol, formaldehyde cross-linked gelatin, acrylic acid.cross-linked polyacrylic acid, divinylbenzene.acrylic acid copolymer or its alkali metal salt, divinylbenzene.methacrylic acid copolymer or its alkali metal salt, and divinylbenzene.styrenesulfonic acid copolymer or its alkali metal salt,

(iii) cooling the dispersion until ethylcellulose separates out from the dispersion to form coating walls on and around the core material, and

(iv) recovering the resultant microcapsules therefrom.

4,462,983

CERTAIN ERGOT PEPTIDE ALKALOIDS ADMINISTERED TO THE NASAL MUCOSA

Moise Azria, Paris, France, and Thomas Cavanak, Oberwil, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 194,998, Oct. 8, 1980, abandoned, which is a continuation of Ser. No. 33,242, Apr. 25, 1979, abandoned, which is a continuation of Ser. No. 852,775, Nov. 18, 1977, abandoned. This application Dec. 8, 1981, Ser. No. 328,680

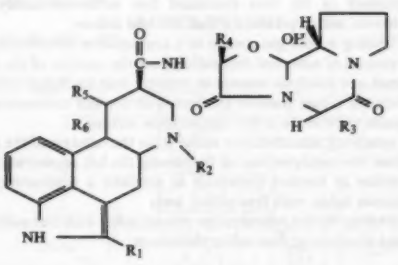
Claims priority, application Switzerland, Nov. 19, 1976, 14575/76; Jun. 7, 1977, 6989/77

Int. Cl.³ A61K *31/495*

U.S. Cl. 424—45 **12 Claims**

1. An improved method of systemically administering a pharmaceutically effective amount of an ergot peptide alkaloid active agent of formula I,

I



wherein

R_1 is hydrogen or halogen,

R_2 is hydrogen, methyl or isopropyl,

either (i)

R_3 is isopropyl, sec-butyl or isobutyl,

R_4 is methyl, ethyl or isopropyl, and

R_5 is hydrogen and R_6 is hydrogen or methoxy

or R_5 and R_6 are together a single bond,

or (ii)

R_3 is benzyl, R_4 is methyl, R_5 is hydrogen and R_6 is hydrogen or methoxy, or (III) dihydroergocristine,

or a pharmaceutically acceptable acid addition salt thereof, the improvement which comprises locally administering to the nasal mucous membranes a therapeutically effective amount of the ergot peptide alkaloid active agent.

4,462,984

SUPPOSITORY BASE COMPOSITION

Mitsuo Mizuno, Yokosuka; Akinori Saginaka, Kamakura; Masahiko Fujii, Tokyo, and Shiuichi Akimoto, Machida, all of Japan, assignors to Nippon Oil and Fats Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 198,581, Oct. 20, 1980, Pat. No. 4,368,185. This application Sep. 27, 1982, Ser. No. 425,101

Claims priority, application Japan, Oct. 26, 1979, 54-138562

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.³ A61K *9/02*

U.S. Cl. 424—78 1 Claim

1. A molded, storage-stable suppository base composition, stable in a temperature range of from 5 degrees C. to 70 degrees C., comprising 5–80% by weight of polyethylene glycol having an average molecular weight of 200–20,000, 5–80% by weight of triglyceride of fatty acid having 6–22 carbon atoms and 5–80% by weight of a compound having the following general formula (1), whose hydroxyl group may be partly or wholly esterified,

$$B[(AO)_a(C_2H_4O)_bH]_n \quad (1)$$

wherein B represents a residue of an alcohol or polyol having 1–8 active hydrogen atoms, A represents C_3H_6 or C_4H_8 alone or in admixture, a represents an integer of 15–50, b represents an integer of 20–200 and n represents an integer of 1–8, and having an average molcular weight of at least 2,500 per one functional group, said suppository composition being substantially homogeneous in liquid and solid states.

4,462,985

DELIVERY OF BIOLOGICALLY ACTIVE COMPONENTS OF HETEROLOGOUS SPECIES INTERFERON ISOLATES

Joseph M. Cummins, Jr., Amarillo, Tex., assignor to University of Illinois Foundation, Urbana, Ill.

Continuation of Ser. No. 180,464, Aug. 22, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,525

Int. Cl.³ A61K *45/02*

U.S. Cl. 424—85 17 Claims

1. In the method for enhancing the competence of a non-human mammal's response to viral and neoplastic disease states wherein exogenous interferon is provided to the circulatory system of a mammal in need of such enhancement, the improvement comprising:

administering to the alimentary canal of the recipient mammal an effective amount of interferon isolated from cells of heterologous mammalian species origin, whereby said interferon is subjected to a digestive environment in the recipient mammal's digestive tract and the non-species-specific antiviral or antineoplastic fraction of said interferon is absorbed through digestive tract tissue and transported to the recipient mammal's circulatory system.

4,462,986

SYNERGISTIC ANTI-HERPES COMPOSITIONS

Kendall O. Smith, San Antonio, Tex., assignor to Ens Bio Logicals, Inc., Ottawa, Canada

Filed Nov. 4, 1982, Ser. No. 439,121

Int. Cl.³ A61K *45/02, 31/505, 31/525*

U.S. Cl. 424—85 8 Claims

1. A therapeutic composition having activity against herpes simplex virus types HSV I and HSV II and comprising an effective amount of a composition comprising, in combination, at least one interferon compound in admixture with 9-[[2-hydroxy-1-(hydroxymethyl)-ethoxy]methyl] guanine or a pharmaceutically acceptable salt thereof, the relative amount of interferon therein being from about 50 to about 500,000 units per microgram of 9-[[2-hydroxyl-1-(hydroxymethyl)ethoxy]-methyl] guanine or salt thereof.

4,462,987

PROCESS AND COMPOSITION FOR TREATING TUMORS IN MICE

Liborio Bonifacio, Via Q. Sella 5, Agropoli, Italy

Continuation-in-part of Ser. No. 195,510, Oct. 10, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,694

Claims priority, application Switzerland, Oct. 11, 1979, 9195/79

Int. Cl.³ A61K *35/32, 35/12, 35/56*

U.S. Cl. 424—99 9 Claims

1. A method for retarding the growth of carcinomas and tumors of the epithelial tissues, sarcomas and tumors of the connective tissue, including leukemia and carcinomas of the prostate, in mice, comprising administering to a tumorous mouse by inoculation an anti-tumor effective amount of a solution of the excrement of a goat, in which said solution is the filtrate of 33.3–200 parts of water, 100–500 parts of goat feces and 100 parts of goat urine.

4,462,988

TREATMENT OF ARTHRITIS WITH BISULFITE

Jose A. Arias-Alvarez, Carpatos, Mexico, assignor to T&R Chemicals, Inc., Clint, Tex.

Filed May 26, 1983, Ser. No. 498,489

Int. Cl.³ A61K *33/04*

U.S. Cl. 424—162 4 Claims

1. A method of treating arthritis and arthritic conditions in a person suffering from the symptoms of arthritis comprising orally administering to said person a symptom-alleviating amount of a compound selected from the group consisting of alkali metal sulfites and alkali metal bisulfites at an effective rate of from about 0.2 to about 50 mg. thereof per kilogram of body weight per 24 hours.

4,462,989

METHOD AND AGENTS FOR ARRESTING INFECTION

Anthony Cerami, Flanders, N.J., assignor to Evreka, Inc., Bergenfield, N.J.

Continuation-in-part of Ser. No. 260,144, May 4, 1981, Pat. No. 4,405,606. This application May 3, 1982, Ser. No. 374,580

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.³ A61K *37/00*

U.S. Cl. 424—177 20 Claims

1. A method for arresting infection in animals in the presence of a body fluid containing iron accessible to the organisms promoting said infection, comprising administering to said infection an exogenously derived agent capable of forming a complex with the iron in said body fluid, which complex is indigestible by said infection promoting organisms, to make said iron nutritionally unavailable to said organisms.

4,462,990

BIOLOGICALLY ACTIVE SUBSTANCES, THEIR OBTAINMENT FROM HUMAN CASEIN AND COMPOSITIONS CONTAINING SAID SUBSTANCES

Pierre Jolles, Paris, and Danièle Migliore-Samour, Le Kremlin Bicetre, all of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

PCT No. PCT/FR81/00126, 371 Date May 21, 1982, 102(e) Date May 21, 1982, PCT Pub. No. WO82/01131, PCT Pub. Date Apr. 15, 1982

PCT Filed Oct. 2, 1981, Ser. No. 385,645

Claims priority, application France, Oct. 3, 1980, 80 21292

Int. Cl.³ A61K *37/00;* C07G *7/00;* C07C *103/52;* C12P *21/06*

U.S. Cl. 424—177 8 Claims

1. A process for obtaining new biologically active immunological substances which stimulate the formation of antibodies and accelerate the phagocytosis phenomenon, which comprises treating a delipidated soluble human casein with at least one proteolytic enzyme selected from trypsin and chymotrypsin, the ratio enzyme/substrate being in the neighborhood of

1/100 for 24 hours at 37° C., then, after centrifugation, fractionating the hydrosoluble products as a function of their mean molecular weight by filtration on a suitable support with 30% acetic acid as eluant, and then isolating the biologically active substances comprising:

(a) substance IV having a mean molecular weight of 5,300;
(b) substance V having a mean molecular weight of 2,230; and
(c) substance VI having a mean molecular weight of 1,120.

4,462,991

METHOD OF INCREASING ORAL ABSORPTION OF POLAR BIOACTIVE AGENTS

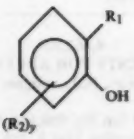
Takeru Higuchi, and Toshiaki Nishihata, both of Lawrence, Kans., assignors to INTERx Research Corp., Lawrence, Kans.

Continuation-in-part of Ser. No. 213,124, Dec. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 128,101, Mar. 7, 1980, abandoned. This application Jun. 11, 1982, Ser. No. 387,410

Int. Cl.[3] **A61K** *37/02*

U.S. Cl. 424—177 **10 Claims**

1. A method for enhancing the rate of absorption of an orally administeredpolypeptide drug having 3 or more residues of amino acid and having a molecular weight of 4000 or less into the bloodstream, said method comprising the steps of preparing a drug form capable of being orally absorbed, said drug form comprising a therapeutically effective dosage amount of said polypeptide drug and an adjuvant of the formula:



wherein R_1 is CO_2H,—(CH_2)—COOH,

SO_3H, or a pharmaceutically acceptable salt thereof wherein R_2 is OH, H, a lower alkoxy radical, a lower alkyl radical, a halo radical, or a tri-halo lower alkyl radical, and

wherein y is an integer of 1 or 2; said adjuvant being present in said drug form in a sufficient amount to be effective in enhancing said oral absorption rate and administering said drug form orally to a warm blooded animal.

4,462,992

NITROIMIDAZOLE RADIOSENSITIZERS FOR HYPOXIC TUMOR CELLS AND COMPOSITIONS THEREOF

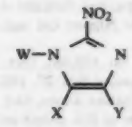
Krishna C. Agrawal, and Masakazu Sakaguchi, both of New Orleans, La., assignors to Research Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,914

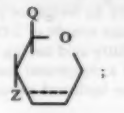
Int. Cl.[1] **A61K** *31/70*; **C07H** *19/08*

U.S. Cl. 424—180 **37 Claims**

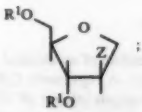
16. A pharmaceutical composition useful for the radiosensitation of hypoxic tumor cells which comprises a radiosensitizing amount of a compound of the formula:



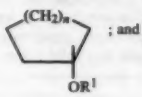
wherein W is selected from the group consisting of:



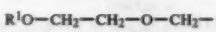
(I)



(II)



; and (III)



(IV)

wherein

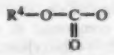
Q is hydrogen or —CH_2OR^1;
Z is hydrogen or —OR^1;
n is 1 or 2:
R^1 are the same or different radicals selected from the group consisting of hydrogen, and

where

R^2 is lower alkyl, phenyl, or lower alkylaryl;

wherein the bond between carbons 2′ and 3′ in structure I may be single or double; and wherein X and Y are the same or different selected from the group consisting of hydrogen,

where R^3 is C_1–C_4 alkyl; nitrile; carboxyamide;



where R^4 is C_1–C_4 alkyl; R^5—N(O)=CH— where R^5 is C_1–C_4 alkyl; $HOCH_2$—; NC—CH_2; 2-phenylvinyl and 2-(nitrophenyl)-vinyl and esters of said compounds.

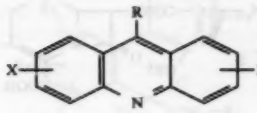
4,462,993

AMINOACRIDINE-α, β-(D)- OR -(L)-N-GLYCOSIDE DERIVATIVES, THE SALTS THEREOF AND A PROCESS FOR THE PREPARATION OF SUCH COMPOUNDS

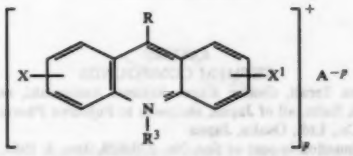
Antal Kovács; András Lipták; Pál Nánási; Jóránt Jánossy; István Csernus; János Erdei; István Kaszab; Kálmán Pólya, all of Debrecen, and András Neszmélyi, Budapest, all of Hungary, assignors to Biogal Gyogyszergyar, Debrecen, Hungary

Filed Mar. 1, 1982, Ser. No. 353,383
Claims priority, application Hungary, Feb. 27, 1981, 474/81
Int. Cl.³ A61K *31/70*; C07H *17/00*
U.S. Cl. 424—180 25 Claims

1. A compound of the formula (I)



or a pharmaceutically acceptable salt thereof of the formula



wherein R is hydrogen, a group of the formula (II)

wherein

R^1 is hydrogen or methyl and

R^2 is hydrogen or a sugar residue or R is dimethylamino;

X and X^1 are identical or different and are hydrogen, $—NR^1R^2$, dimethylamino, halogen, C_1 to C_4 alkoxy, nitro, cyano, carbomethoxy, carbamoyl, phenyl, or C_1 to C_4 alkyl-phenyl;

R^3 is hydrogen or C_1 to C_5 alkyl;

p is 1 or 2; and

A^{-p} is a pharmaceutically acceptable anion, with the restriction that at least one of the substituents R, X and X^1 represents a group of the formula $—NR^1R^2$ wherein R^2 is a sugar residue.

24. An antimicrobial pharmaceutical composition which comprises an antimicrobially effective amount of a compound of the formula I as defined in claim 25 or an antimicrobially effective amount of a pharmaceutically acceptable salt thereof in combination with an inert carrier.

25. A method of treatment for a subject having a microbial disease which comprises the step of administering to said subject an antimicrobially effective amount of the compound defined in claim 1 or an antimicrobially effective amount of a pharmaceutically acceptable salt thereof.

4,462,994

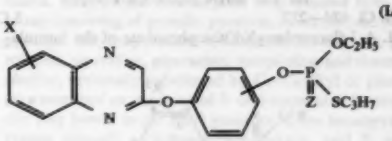
N-CONTAINING HETEROCYCLIC RING-SUBSTITUTED O-ARYLPHOSPHATE DERIVATIVES, PREPARATION THEREOF, AND INSECTICIDES, ACARICIDES AND NEMATOCIDES CONTAINING SAID DERIVATIVES

Gojyo Sakata; Tatsuo Numata; Kazuya Kusano, all of Funabashi; Masayoshi Hirose, and Kiminori Hirata, both of Minami Saitama, all of Japan, assignors to Nissan Chemical Industries, Inc., Tokyo, Japan

Filed May 10, 1982, Ser. No. 376,639
Claims priority, application Japan, May 19, 1981, 56-75149; Nov. 26, 1981, 56-189680
Int. Cl.³ C07F *9/18*
U.S. Cl. 424—200 15 Claims

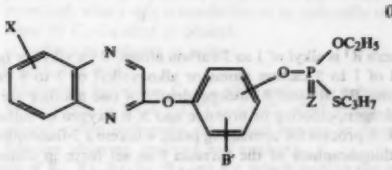
1. An N-containing heterocyclic ring-substituted O-arylphosphate selected from the group consisting of the compounds of the formulae (IA)′ and (IB):

(IA)′



and

(IB)



wherein X represents hydrogen, a halogen or trifluoromethyl; Z represents oxygen or sulfur; and B′ represents a halogen or a C_1–C_4 alkyl.

4,462,995

PYRIDYL PHOSPHOROTHIOATE COMPOSITIONS AND THEIR USE AS ANABOLIC AGENTS

Douglas R. Ware, Riverview, Fla., and Theo A. Hymas, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1980, Ser. No. 216,691
Int. Cl.³ A61K *31/675*
U.S. Cl. 424—200 10 Claims

1. A method of increasing the growth rate and/or improving the feed conversion efficiency in ruminants and swine which comprises administering to said ruminant or swine an effective amount of from about 0.3 to about 4 milligrams per kilogram of bodyweight per day of a pyridyl phosphorothioate compound from the group consisting of O,O-diethyl, O-3,5,6-trichloro-2-pyridyl phosphorothioate; O,O-dimethyl, O-3,5,6-trichloro-2-pyridyl phosphorothioate; or a physiologically acceptable salt thereof or a combination thereof.

4,462,996

AQUEOUS SUSPENSION OF OXENDOLONE

Etsunosuke Noda, Yao; Yoshiharu Matukura, Ikoma, and Akihiro Nagai, Toyono, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 9, 1982, Ser. No. 406,460
Claims priority, application Japan, Aug. 18, 1981, 56-129517
Int. Cl.³ A61K *31/56*
U.S. Cl. 424—243 5 Claims

1. A stabilized aqueous suspension of oxendolone or an ester thereof, which contains 0.05 to 1.0 w/v percent of a nonionic

surfactant and 0.01 to 0.25 w/v percent of a p-hydroxybenzoic acid ester.

4,462,997

3-FLUOROPHENYL (DI)THIOPHOSPHATES, AND THEIR USE FOR CONTROLLING PESTS

Walter Seufert; Hans-Peter Loeffler, both of Ludwigshafen, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

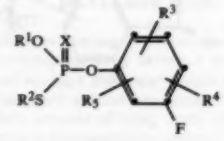
Filed Aug. 24, 1982, Ser. No. 410,878

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134136

Int. Cl.³ A01N *57/14*; C07F *9/165*

U.S. Cl. 424—217 **5 Claims**

1. A 3-fluorophenyl(di)thiophosphate of the formula



(I)

where R^1 is alkyl of 1 to 3 carbon atoms, R^2 is alkyl or haloalkyl of 1 to 5 carbon atoms or alkoxyalkyl of 2 to 8 carbon atoms, R^3, R^4 and R^5 independently of one another are each hydrogen, chlorine or bromine and X is oxygen or sulfur.

4. A process for combating pests, wherein a 3-fluorophenyl(-di)thiophosphate of the formula I as set forth in claim 1 is allowed to act on the pests or their habitat.

4,462,998

METHOD OF USING A CIS-PLATINUM(II) AMINE ASCORBATE

Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 332,113, Dec. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 237,221, Feb. 23, 1981, abandoned, and a continuation-in-part of Ser. No. 196,811, Oct. 14, 1980, abandoned, which is a division of Ser. No. 50,843, Jun. 20, 1979, abandoned. This application Nov. 4, 1983, Ser. No. 549,017

Int. Cl.³ A61K *31/555*

U.S. Cl. 424—245 **13 Claims**

1. A method for treating animal malignant tumor cells sensitive to a platinum complex of the formula:

$$cis\text{-}[Pt(II)A_2(X)_m(OH)_n]$$

wherein Pt is in valence state II and is coordinated to A in a cis configuration, A is ammonia or a monodentate alkylamine ligand, A_2 is a bidentate amine ligand, X is the ascorbate moiety, m is an integer having a value of from 1 to 2, n is an integer having a value of from 0 to 1 and the sum of m and n is not greater than 2; which comprises administering to an animal afflicted with said tumor cells an effective amount of cis-$[Pt(II)A_2(X)_m(OH)_n]$ sufficient to cause regression of said tumor cells.

4,462,999

7-ACYLAMINO-3-SUBSTITUTED CEPHALOSPORANIC ACID DERIVATIVES AND PROCESSES FOR THE PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Sumiyoshi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

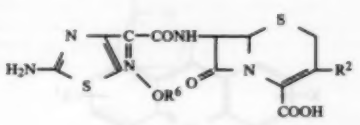
Continuation-in-part of Ser. No. 206,831, Nov. 14, 1980, Pat. No. 4,409,215. This application May 8, 1981, Ser. No. 261,781

Claims priority, application United Kingdom, Nov. 19, 1979, 7939985; Feb. 8, 1980, 8004335; Apr. 21, 1980, 8012991

Int. Cl.³ C07D *501/56*; A61K *31/545*

U.S. Cl. 424—246 **5 Claims**

1. A syn isomer of a compound of the formula:



in which

R^2 is methoxymethyl or methylthiomethyl, and

R^6 is carboxy(lower)alkyl,

and a pharmaceutically acceptable salt thereof.

4,463,000

CEPHEM COMPOUNDS

Tsutomu Teraji, Osaka; Kazuo Sakane, Amagasaki, and Jiro Goto, Suita, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 270,029, Jun. 3, 1981. This application Aug. 19, 1981, Ser. No. 294,291

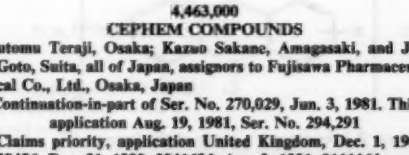
Claims priority, application United Kingdom, Dec. 1, 1980, 8038456; Dec. 31, 1980, 8041636; Apr. 9, 1981, 8111164

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ A61K *31/545*; C07D *501/46*

U.S. Cl. 424—246 **39 Claims**

1. Cephem compounds of the formula:



wherein

R^1 is amino or a protected amino group;

R^2 is lower alkyl which may be substituted with a substituent selected from the group consisting of carboxy and protected carboxy, cyclo (lower) alkyl, cyclo (lower) alkenyl or lower alkynyl; and

R^3 is a pyridinio group substituted with a substituent selected from the group consisting of halogen, cyano, hydroxy, amino, acylamino, lower alkanoyl, hydroxycarbamoyl, alkylcarbamoyl, carboxy, protected carboxy, lower alkyl, hydroxy (lower) alkyl, sulfo (lower) alkyl, protected amino (lower) alkyl, amino (lower) alkyl, carboxy (lower) alkyl and hydroxyimino (lower) alkyl; and pharmaceutically acceptable salts thereof.

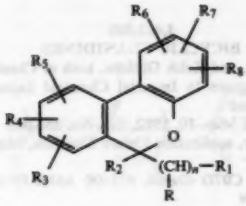
3. A pharmaceutical antibacterial composition comprising an antimicrobially effective amount of a compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,463,001
6-SUBSTITUTED 6H-DIBENZO[b,d]PYRAN DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Piero Melloni, Bresso; Paolo Salvadori, and Pier P. Lovisolo, both of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Oct. 1, 1981, Ser. No. 307,597
Claims priority, application United Kingdom, Oct. 20, 1980, 8033774; Sep. 14, 1981, 8127718
Int. Cl.³ A61K *31/35*; C07D *311/80*
U.S. Cl. 424—246 15 Claims

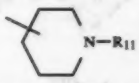
1. A compound of general formula (I)



(I)

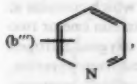
wherein

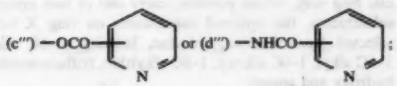
R_1 represents (a) cyano; (b) a carboxy group, or an esterified carboxy group of the formula —$COOR_{10}$, wherein R_{10} is



wherein R_{11} is hydrogen, methyl or ethyl; or R_{10} is C_1–C_6 alkyl optionally substituted by (a‴)

wherein R_a and R_b are as defined below,





wherein each of R_a and R_b, being the same or different, is hydrogen or unsubstituted C_1–C_6 alkyl, or R_a and R_b, taken together with the nitrogen atom to which they are linked, form a heteromonocyclic ring selected from the group consisting of pyrrole, pyrazole, imidazole, dihydropyridine, dihydropyrazine, 1,4-oxazine, 1,4-thiazine, pyrrolidine, piperidine, piperazine, morpholine and thiomorpholine, optionally substituted by C_1–C_6 alkyl or phenyl; (d)

wherein each of R_c and R_d, being the same or different, is hydrogen or C_1–C_6 alkyl unsubstituted or substituted by

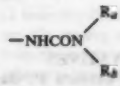
wherein R_a and R_b are as defined above, or R_c and R_d, taken together with the nytrogen atoms to which they are linked, form a heteromonocyclic ring selected from the group consisting of pyrrole, pyrazole, imidazole, dihydropyridine, dihydropyrazine, 1,4-oxazine, 1,4-thiazine, pyrrolidine, piperidine, piperazine, morpholine and thiomorpholine optionally substituted by C_1–C_6 alkyl or phenyl; (e) a saturated or unsaturated 5- or 6-membered heterocyclic ring bound to the alkyl group or to the benzopyrane system through a carbon-carbon linkage, said 5- or 6-membered heterocyclic ring being selected from the group consisting of pyridyl, piperidyl, piperazinyl and pyrazinyl, which ring is unsubstituted or optionally substituted by C_1–C_6 alkyl or phenyl;

R is hydrogen; hydroxy or amino;

n is zero, 1, 2 or 3;

R_2 represents hydrogen; C_1–C_6 alkyl optionally substituted by hydroxy or by a —OCO—C_1–C_6 alkyl group; or a phenyl group optionally substituted by one or more of fluorine, chlorine, hydroxy and methoxy;

each of R_3, R_4, R_5, R_6, R_7 and R_8, which may be the same or different, is selected from (a″) hydrogen; halogen; halo-C_1–C_6 alkyl; or C_1–C_6 alkyl optionally substituted by amino; (b″) amino; nitro; or



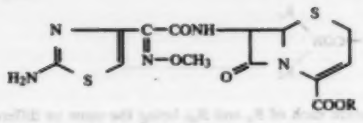
wherein R_a and R_b are as defined above (c″) —OR_9, wherein R_9 is hydrogen, C_1–C_6 alkyl or C_2–C_6 alkenyl; and the pharmaceutically or veterinarily acceptable salts thereof.

4,463,002
SYN-ISOMERS OF 7-SUBSTITUTED-3-CEPHEM-4-CARBOXYLIC ACID ESTERS

Takao Takaya, Kawanishi; Hisashi Takasugi, Suminoe; Kiyoshi Tsuji, Kishiwada, and Toshiyuki Chiba, Higashinari, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 302,668, Sep. 15, 1981, Pat. No. 4,427,674, which is a division of Ser. No. 886,340, Mar. 14, 1978.
This application May 14, 1982, Ser. No. 378,334
Claims priority, application Japan, May 21, 1981, 56-77447
Int. Cl.³ A61K *31/545*; C07D *501/20*
U.S. Cl. 424—246 5 Claims

1. Syn-Isomers of 7-substituted-3-cephem-4-carboxylic acid esters of the formula:



wherein R is 2-ethylbutyryloxymethyl or 3,3-dimethylbutyryloxymethyl,
or salts thereof.

4,463,003

CEPHEM COMPOUNDS

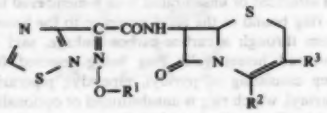
Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka, and Hideaki Yamanaka, Hirakata, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 22, 1982, Ser. No. 452,302

Int. Cl.³ A61K *31/545;* **C07D** *501/34, 501/56*

U.S. Cl. 424—246 **5 Claims**

1. A compound of the formula:



wherein

R^1 is carboxy (C_1–C_6) alkyl or esterified carboxy (C_1–C_6) alkyl,

R^2 is carboxy or esterified carboxy, and

R^3 is (C_1–C_6) alkanoyloxy (C_1–C_6) alkyl, tetrazolopyridazinylthio (C_1–C_6) alkyl,

tetrazolothio (C_1–C_6) alkyl, or (C_1–C_6) alkyl tetrazolothio (C_1–C_6) alkyl,

and pharmaceutically acceptable salts thereof.

5. An antibacterial composition comprising an effective of a compound of claim 1 in association with a pharmaceutically acceptable substantially non-toxic carrier or excipient.

4,463,004

DIOXAZABICYCLIC DERIVATIVES

Patrick G. Guerret, Rueil Malmaison; Bernard P. Bucher, Marnes la Coquette; Philippe L. Dostert; Gisèle C. Mocquet, both of Paris, and Alain L. Nedelec, Colombes, all of France, assignors to Delalande S.A., Courbevoie, France

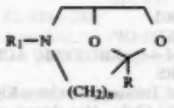
Filed Apr. 16, 1982, Ser. No. 368,924

Claims priority, application France, Apr. 21, 1981, 81 07904; Mar. 31, 1982, 82 05553

Int. Cl.³ A61K *31/535;* **C07D** *491/08*

U.S. Cl. 424—248.5 **21 Claims**

1. A compound having the formula:



(I)

wherein R_1 is hydrogen, alkyl having 1 to 4 carbon atoms, cyclohexyl or benzyl; R is selected from the group consisting of (1) alkyl having at least 4 carbon atoms, (2) cyclohexyl, (3) unsubstituted phenyl or phenyl substituted with one or more halogen atoms, or by a methyl, methoxy, hydroxy, cyano, nitro, trifluoromethyl, carboxyl, ethoxycarbonyl, acetamido, methylsulfonyl, phenoxy, benzoyl, phenyl, α-hydroxybenzyl, cyclohexyl or carbamoyl, (4) thienyl, (5) pyridyl, (6) naphthyl, (7) methoxy-substituted naphthyl; (8) adamantyl and (9) benzyl; and n is 1, 2 or 3, with the provisos that (a) when R is carboxyphenyl, benzoylphenyl, or (α-hydroxybenzyl)phenyl, n is not 3, and (b) when R is (60-hydroxybenzyl) phenyl, R^1 is not benzyl, and pharmacologically aceeptable acid addition salts thereof.

20. A pharmaceutical composition for treating pain comprising an effective amount of a compound as claimed in claim 1, in combination with a pharmaceutically acceptable carrier, diluent or vehicle.

4,463,005

BICYCLIC GUANIDINES

Derrick J. Jones, and Keith Oldham, both of Cheshire, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

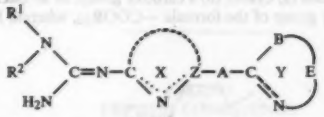
Filed Mar. 10, 1982, Ser. No. 356,802

Claims priority, application United Kingdom, Mar. 18, 1981, 8108408

Int. Cl.³ C07D *401/06, 413/06;* **A61K** *31/505*

U.S. Cl. 424—249 **10 Claims**

1. A guanidine derivative of the formula I:



I

in which

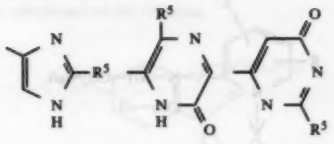
R^1 and R^2, which may be the same or different, are hydrogen, or branched or unbranched 1–10C alkyl, 3–8C cycloalkyl or 4–14C cycloalkylalkyls, each alkyl, cycloalkyl or cycloalkylalkyl being optionally substituted by one or more halogens selected from fluorine, chlorine and bromine provided that at least one of R^1 and R^2 is a halogen-substituted alkyl, cycloalkyl or cycloalkylalkyl and provided that there is no halogen on the carbon of the alkyl, cycloalkyl or cylcloalkylalkyl which is directly attached to the nitrogen;

in ring X the dotted line is a double bond on one side of the nitrogen and Z is carbon or nitrogen such that ring X is 6-membered aromatic heterocyclic ring which contains at least one nitrogen and may optionally contain one or two additional hetero atoms selected from oxygen, nitrogen and sulphur, wherein that ring is selected from pyrazine, pyridine, pyrimidine and 1,3,5-triazine, which heterocyclic ring may, where possible, carry one or two optional substituents, the optional substituents on ring X being selected from fluorine, chlorine, bromine, 1–6C alkyl, 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, trifluoromethyl, hydroxy and amino;

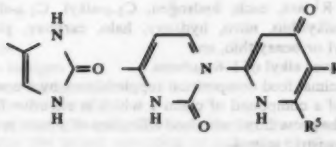
—A— is a 1–8C alkylene chain which is optionally substituted by one or two 1–3C alkyls and into which is optionally inserted, as part of the backbone of the chain, NH or 1–6C N-alkyl or one or two groups selected from oxygen, sulphur, cis and trans vinylene, ethynylene, phenylene and 5–7C, alkylene provided that no two insertions selected from oxygen and sulphur are directly attached one to the other, and provided that when an optional insertion is made in chain A which results in the inserted group being directly attached to ring Y the inserted group is other than NH or N-alkyl;

or —A— is 5–7C cycloalkylene or phenylene;

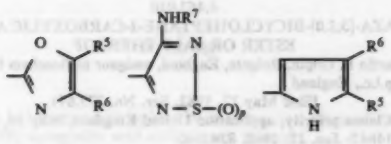
ring Y is of the formula IV, V, VI, VII, VIII, IX, X, XI, XII, XIII, XIV, XV or XVII:



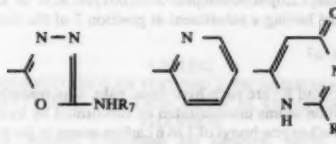
IV V VI



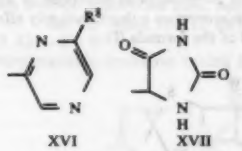
VII VIII IX



X XI XII



XIII XIV XV



XVI XVII

in which

R^5 is hydrogen or of the formula NHR^7, R^6 is hydrogen, cyano, nitro, methoxycarbonyl, carbamoyl, methylcarbamoyl or dimethylcarbamoyl, R^7 is hydrogen or methly, R^8 is hydrogen, chlorine or bromine and p is 1 or 2:

and the pharmaceutically-acceptable acid-addition salts thereof.

4,463,006

DIGLYCIDYL-PTERIDINE COMPOUNDS

Hinrich Möller, Monheim; Brigitte Hase, Erkrath; Günther Konrad, Hilden; Hans-Christoph Wilk, Neuss, and Ulrich Zeidler, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

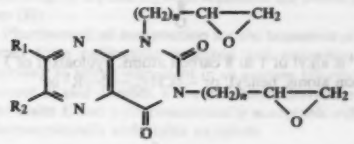
Filed Jun. 23, 1982, Ser. No. 391,174

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131396

Int. Cl.³ A61K *31/505;* **C07D** *475/02, 475/14*

U.S. Cl. 424—251 **36 Claims**

1. A diglycidyl-substituted heterocyclic compound of the formula:



I

wherein n is the whole number 1 or 2, R_1 and R_2 are the same or different, and are either hydrogen; or together form a 5- or 6-membered carbocyclic or heterocyclic ring; or are one of the following groups which contain from 1 to 12 carbon atoms:

(a) a straight or branched chain alkyl group optionally containing from 1 to 3 oxygen or sulfur atoms;

(b) a straight or branched chain unsaturated hydrocarbon group;

(c) a cycloaliphatic hydrocarbon group,

(d) an aromatic hydrocarbon-substituted alkyl group,

(e) an aromatic hydrocarbon group,

(f) a heterocyclic group containing at least one heteroatom selected from the group consisting of O, N, P, and S, provided that when the heteroatom is nitrogen, the nitrogen atom is free of hydrogen atoms,

(g) a cycloaliphatic hydrocarbon-substituted alkyl group, and

(h) a heterocyclic-substituted alkyl group wherein the heterocyclic moiety contains at least one heteroatom selected from the group consisting of O, N, P, and S, provided that when the heteroatom is nitrogen, the nitrogen atom is free of hydrogen atoms;

and wherein when one or both of the R groups are other than hydrogen, at least one of the following substituents may be present thereon: a straight or branched chain alkyl radical, a straight or branched chain alkenyl radical, a straight or branched chain alkynyl radical, halogen, alkoxy, cyano, alkylmercapto, arylmercapto, alkylsulfoxy, arylsulfoxy, aryloxy, and acyloxy.

4,463,007

TRIAZOLOQUINAZOLINONES, AND COMPOSITIONS AND METHODS FOR TREATING ALLERGIC DISORDERS WITH THEM

Rainer Schlecker, Bissersheim; Ludwig Friedrich, Bruehl, and Dieter Lenke, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

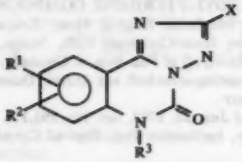
Filed Nov. 15, 1982, Ser. No. 441,805

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146599

Int. Cl.³ A61K *31/505;* **C07D** *487/04*

U.S. Cl. 424—251 **11 Claims**

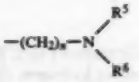
1. A compound of the formula I



(I)

where X is carboxyl which may be in the form of a salt with a physiologically tolerated amine or metal cation, or is

where R^4 is alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 8 ring carbon atoms, benzyl, or $-(CH_2)_n-O-R^5$ or



where n is an integer from 2 to 4 and R^5 and R^6 are each alkyl of 1 to 3 carbon atoms, or X is hydroxymethyl, nitrile, tetrazolyl, carbonylaminotetrazolyl or carbamyl, and R^1 and R^2 are identical or different and are each hydrogen, fluorine, chlorine, bromine, alkyl of 1 to 5 carbon atoms, trifluoromethyl, nitro, amino, an alkyl, monoalkylamino or dialkylamino group where alkyl is of 1 to 5 carbon atoms, alkoxy where alkyl is of 1 to 6 carbon atoms, or an alkylthio, alkylsulfenyl, alkylsulfonyl or dialkylaminosulfonyl radical where alkyl is of 1 to 6 carbon atoms, or R^1 and R^2 together form an alkylenedioxy group $-O-(CH_2)_n-O-$ where n is 1 or 2, or an alkylene group $-(CH_2)_n-$ where n is 3, 4 or 5, and R^3 is hydrogen, alkyl which is of 1 to 7 carbon atoms and may or may not be interrupted by 1 or 2 oxygen atoms, alkenyl of 2 to 7 carbon atoms or aralkyl of 7 to 10 carbon atoms, and its physiologically tolerated salts with acids.

6. A therapeutic composition for treating allergic disorders which comprises: a pharmaceutically acceptable carrier and an effective amount of a compound of the formula I of claim 1 as the active agent.

9. A process for treating allergic disorders which comprises: administering orally, parenterally or by inhalation a composition as set forth in claim 6 in individual doses containing from 0.1 to 100 mg of active agent.

4,463,008

2-ALKOXY-5-(PYRIDINYL)PYRIDINES AND CARDIOTONIC USE THEREOF

George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Baldev Singh, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 10, 1982, Ser. No. 440,505
Int. Cl.³ A61K *31/44;* C07D *401/04*
U.S. Cl. 424—263 9 Claims

1. 2-(R_1O)-3-Q-5-PY-6-R-pyridine having the formula

or a pharmaceutically acceptable acid-addition salt thereof, where R_1 is methyl or ethyl, R is hydrogen or lower-alkyl, Q is hydrogen, bromo, chloro or COOR′ where R′ is lower-alkyl, and PY is 4(or 3)-pyridinyl or 4(or 3)-pyridinyl having one or two lower-alkyl substituents.

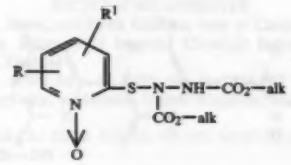
4,463,009

DIALKYL 1-(2-PYRIDINYLTHIO)-1,2-HYDRAZINEDICARBOXYLATE, N-OXIDES AND THEIR USE AS ANIMAL GROWTH STIMULANTS

Winfred J. Sanders, Mt. Holly, N.J., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Apr. 15, 1983, Ser. No. 485,558
Int. Cl.³ A61K *31/44;* C07D *221/00*
U.S. Cl. 424—263 10 Claims

1. A chemical compound of the formula:



in which:

R and R^1 are, each, hydrogen, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{1-6}-alkylthio, nitro, hydroxy, halo, carboxy, phenyl, benzyl or benzylthio, and

alk is lower alkyl of 1–6 carbons.

5. An animal feed composition supplemented by a nontoxic quantity of a compound of claim 1 which is effective for increasing the growth rate and feed efficiency of a meat producing, monogastric animal.

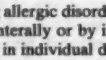
4,463,010

1-AZA-[3.2.0]-BICYCLOHEPTANE-2-CARBOXYLIC ACID, ESTER OR SALT THEREOF

Martin L. Gilpin, Reigate, England, assignor to Beecham Group p.l.c., England

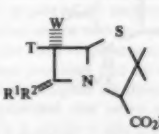
Filed May 12, 1982, Ser. No. 377,671
Claims priority, application United Kingdom, May 14, 1981, 8114847; Jan. 21, 1982, 8201642
Int. Cl.³ A61K *31/425, 31/42;* C07D *499/42, 499/46, 263/00*
U.S. Cl. 424—270 26 Claims

1. A 1-aza[3.2.0]bicycloheptan-2-carboxylic acid or salt or ester thereof having a substituent at position 7 of the formula:



wherein R^1 and R^2 are each hydrogen, halo, a hydrocarbon of 1 to 10 carbon atoms unsubstituted or substituted by hydroxy, carboxy or alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, cyano or esterified carboxyl.

11. A pharmaceutical composition useful for treating Bacillus, Staphylococcus and Streptococcus infections in animals including humans which comprises a therapeutically effective amount of a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable ester thereof wherein R^1 and R^2 are each hydrogen, halo, a hydrocarbon of 1 to 10 carbon atoms unsubstituted or substituted by hydroxy, carboxy or alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety, cyano or esterified

carboxyl; T is hydrogen, amino or acylamino; and W is hydrogen, arylthio, alkylthio of 1 to 6 carbon atoms or methoxy, in combination with a pharmaceutically acceptable carrier.

4,463,011

BIS-IMIDAZOLYL-BIS-PHENYLMETHANE DERIVATIVES AND THEIR USE AS FUNGICIDES

Masaru Ogata, Hyogo; Katsuya Tawara, Osaka; Yoshikachi Watanabe, Shiga; Hiroshi Matsumoto, Osaka, and Toshio Takahashi, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

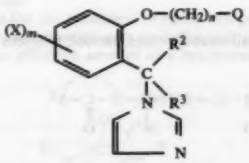
Division of Ser. No. 157,166, Jun. 6, 1980, Pat. No. 4,328,348. This application Jan. 22, 1982, Ser. No. 341,634

Claims priority, application Japan, Jun. 7, 1979, 54-71953; Sep. 7, 1979, 54-115465

Int. Cl.³ A01N *43/50*; **C07D** *403/02*

U.S. Cl. 424—273 R **9 Claims**

1. A compound of the formula:



wherein

X is halogen;

m is an integer of 0 to 3;

n is an integer of 0 to 4;

Q is phenyl optionally substituted by 1 to 3 members selected from the group consisting of halogen, C_1–C_5 alkyl and C_1–C_5 alkoxy; and

is 1-(1-imidazolyl)-1-phenylmethylene, or a pharmaceutically acceptable acid addition salt thereof.

4,463,012

NITROIMIDAZOLES HAVING TRICHOMONACIDAL ACTIVITY AND PHARMACEUTICAL COMPOSITIONS THEREOF

Loris J. Bononi, Castiglione del Terziere, 54020, Gabbiana (Massa Carrara), Italy

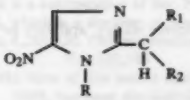
Filed Apr. 21, 1982, Ser. No. 370,651

Claims priority, application Italy, Apr. 21, 1981, 21298 A/81

Int. Cl.³ A61K *31/415*; **C07D** *233/94*

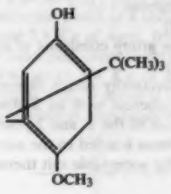
U.S. Cl. 424—273 R **9 Claims**

1. Nitroimidazole derivative having formula:



(I)

wherein R represents an alkyl having 1 to 5 carbon atoms, hydroxyalkyl having 1 to 5 carbon atoms, an alkylsulfonic group, an amino-alkyl group in which the alkyl contains 1 to 5 carbon atoms and the amino group is the radical of a secondary or tertiary, linear or cyclic amine; R_1 is —OH and R_2 represents the group:



(II)

the tert-butyl substituent being in the 3, 4 or 6 position of the anisole ring, or R_1 and R_2 both represent the above indicated group (II).

4. Pharmaceutical composition for the treatment of diseases induced from pathogenic protozoa and anaerobic bacteria comprising as active ingredient in an amount effective for the treatment of said diseases, a nitroimidazole derivative according to claim 1, and a pharmaceutically acceptable vehicle and a pharmaceutically acceptable excipient.

4,463,013

OXYGEN SUBSTITUTED AMINO-CYCLOHEXYL-BENZENEACETAMIDES AND -BENZAMIDES AS WATER DIURETIC DRUGS

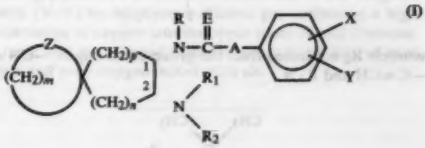
Robert J. Collins; Lester J. Kaplan, both of Kalamazoo; James H. Ludens, Portage, and Philip F. Von Voigtlander, Gunplain Township, Allegan County, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 366,908, Apr. 9, 1982, abandoned. This application Aug. 18, 1982, Ser. No. 409,225

Int. Cl.³ A61K *31/40*

U.S. Cl. 424—274 **4 Claims**

1. A process for treating a warm-blooded animal patient suffering from inappropriate hyperhydration which comprises administering to such patient a safe, non-toxic amount sufficient to obtain a water diuretic effect of a compound of the formula selected from the group consisting of



(I)

wherein

p is a whole number integer 0, 1 or 2 and n is a whole number integer 1, 2, or 3, so that the resulting cycloaliphatic ring containing them has six (6) carbon atoms;

m is 2 or 3;

A is $—(CH_2)_q$ where q is a whole number integer 1 to 4, —CH(CH_3)—; or A is a single chemical bond (—) only when R_1 and R_2 are taken together with the nitrogen to which they are bonded to complete a ring amine group set forth below;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, nitro, methoxy, hydroxy, azido, C_1 to C_3-alkyl, phenyl, methanesulfonyl, cyano, amino, C_1 to C_3-alkoxycarbonyl, C_1 to C_3-alkanoyloxy, C_1 to C_3-carboxyacylamino (—NHC(=O)R_4 where R_4 is hydrogen or C_1 to C_2-alkyl);

R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are each hydrogen, C_1 to C_3-alkyl or allyl,

R_1 and R_2, taken together with the nitrogen to which they

are bonded, complete a ring selected from the group consisting of azetidinyl, pyrrolidinyl and piperidinyl, pyrrolyl, 3-pyrrolinyl, 3-azabicyclo[3.1.0]-hexan-3-yl and 3-azabicyclo[3.2.0]heptan-3-yl;

E is oxygen or sulfur;

Z is selected from the group consisting of oxygen, bivalent sulfur, and sulfinyl;

provided that the diuretically active formula I compound contains an isomer thereof with an S absolute structural configuration at each of the 1- and 2-positions of the cyclohexane ring carbons bonded to the nitrogen atoms,

or a pharmacologically acceptable salt thereof.

4,463,014

CYCLOPROPANE CARBOXYLATES

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

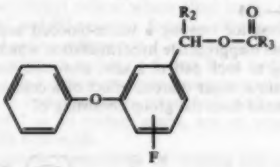
Filed Apr. 5, 1982, Ser. No. 365,462

Claims priority, application France, Apr. 16, 1981, 81 07660

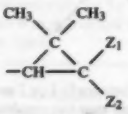
Int. Cl.³ A01N 53/00; C07C 69/74, 69/743, 69/747

U.S. Cl. 424—275 **28 Claims**

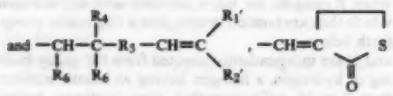
1. A compound selected from the group consisting of esters in their steriosomeric form or mixtures thereof of the formula



wherein R_2 is selected from the group consisting of —CN and —C≡CH and R_3 is



Z_1 is hydrogen and Z_2 is selected from the group consisting of



R_1' and R_2' taken together with the carbon atom to which they are attached form cycloalkylidene of 3 to 7 carbon atoms R_4, R_5 and R_6 are individually halogen.

13. A method for combatting pests of vegetables, of warm-blooded animals and of permises comprising contacting them with a pesticidally effective amount of at least one compound of claim 1 and an inert carrier.

4,463,015

ARYL SUBSTITUTED 7-OXABICYCLOHEPTANE COMPOUNDS, USEFUL IN INHIBITING PLATELET AGGREGATION

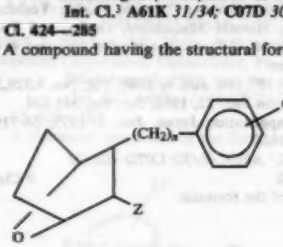
Martin F. Haslanger, Lambertville, and Masami Nakane, Plainsboro, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 18, 1982, Ser. No. 409,192

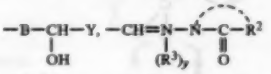
Int. Cl.³ A61K 31/34; C07D 307/00

U.S. Cl. 424—285 **19 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof; wherein Z is



n is 1 or 2;

R^1 is H or lower alkyl;

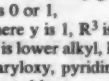
B is —CH=CH—, —C≡C— or $(CH_2)_2$;

Y is alkyl; aryl-lower alkyl; alkenyl; alkynyl; aryl, pyridyl, pyridyl-lower alkyl; substituted pyridyl wherein the substituent is 1 or 2 halogen or lower alkyl groups; thienyl; thienylalkyl; substituted thienyl wherein the substituent is 1 or 2 halogen or lower alkyl groups; cycloalkyl; substituted cycloalkyl wherein the substituent is 1 or 2 halogens, 1 or 2 lower alkyl groups or lower alkoxy groups; cycloalkylalkyl or substituted cycloalkylalkyl wherein the substituent is 1 or 2 halogens, 1 or 2 lower alkyl groups or lower alkoxy groups;

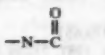
y is 0 or 1,

where y is 1, R^3 is H or lower alkyl;

R^2 is lower alkyl, lower alkoxy, aryl, alkylamino, arylamino, aryloxy, pyridinyl or cycloalkyl or where y is 0 as indicated by



R^2 can be a $—(CH_2)_x$ linking group (wherein x is 3, 4 or 5) which together with



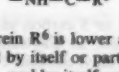
may form an N-containing 5-, 6- or 7-membered heterocycle, with the proviso that when R^3 is H, R^2 is lower alkoxy;

R^4 is lower alkyl, cycloalkyl, aryl, aryl-alkyl or alkanoyl;

p is 0 to 5;

m is 1 to 8; and

R^5 is lower alkyl, lower alkoxy, aralkoxy or



wherein R^6 is lower alkyl or phenyl; wherein alkyl or lower alkyl by itself or part of another group contains 1 to 12 carbons, aryl by itself or part of another part refers to a monocy-

clic or bicyclic aromatic group which contains 6 to 10 carbon atoms in the ring and which ring may be unsubstituted or contain 1 or 2 halogen, lower alkyl and/or lower alkoxy groups, alkenyl contains 3 to 6 carbon atoms, alkynyl contains 3 to 6 carbon atoms, and cycloalkyl contains 3 to 6 carbon atoms, and cycloalkyl contains 3 to 12 carbon atoms in the ring.

15. A method of inhibiting platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

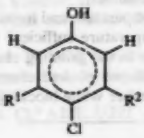
4,463,016

METHOD FOR THE TREATMENT OF RAZOR BUMPS

Nelson L. Burgess, Bronx, N.Y., assignor to Nel's Laboratory, Inc., Bronx, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,474
Int. Cl.³ A61K *31/055*
U.S. Cl. 424—347 **6 Claims**

1. A method for the treatment of razor bumps which comprises topically administering to an individual suffering from razor bumps an effective amount of a compound of the Formula:



I

wherein R^1 and R^2 are C_1–C_7 alkyl in combination with a vehicle which facilitates topical application of the compound of Formula I.

4,463,017

COMPOSITION FOR TOPICAL ADMINISTRATION

Jaime Hidalgo, La Tour-de-Peilz, and Rolf Jost, Clarens, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 112,151, Jan. 14, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 302,183
Claims priority, application France, Jan. 16, 1979, 79 00952
Int. Cl.³ A61K *7/15, 7/42, 47/00*
U.S. Cl. 424—359 **3 Claims**

1. In a composition for topical administration containing a carrier and an active ingredient, the improvement which comprises the active ingredient being a hydrolysate of lactalbumin obtained solely by the action of an endopeptidase, said hydrolysate consisting essentially of peptides having a molecular weight of from 200 to 5,000 and being present in the composition in a proportion of from 0.5 to 25% by weight, expressed as dry weight of hydrolysate in the composition.

4,463,018

ARTIFICIAL BAIT FOR AQUATIC SPECIES

William E. S. Carr, St. Augustine, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 336,706, Jan. 4, 1982, abandoned, which is a continuation of Ser. No. 189,634, Sep. 22, 1980, abandoned, which is a division of Ser. No. 020,089, Mar. 13, 1979, Pat. No. 4,245,420. This application Apr. 16, 1982, Ser. No. 369,208
The portion of the term of this patent subsequent to Jan. 20, 1998, has been disclaimed.
Int. Cl.³ A23K *1/18*; A23L *1/04*
U.S. Cl. 426—1 **5 Claims**

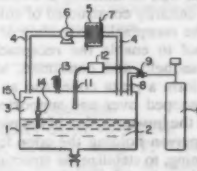
1. An artificial bait comprising a semi-rigid, flexible, water-insoluble, hydrophilic matrix which is permeable, by diffusion, to the passage of an attractant for aquatic species incorporated therein and which is capable of releasing said attractant upon immersion in an aqueous medium at a predetermined and controlled rate over a prolonged period of time, said matrix comprising as the semi-solid phase of a colloidal solution of: from about 0.16 to about 2.6 Kg of Agar, from about 0.06 to about 1.3 Kg of Locust bean gum, from about 0.32 to about 5.2 Kg of Gelatin, from 0 to about 6.4 Kg of a partially hydrolyzed cellulose, from about 0.03 to about 0.37 Kg of Sorbic Acid, from about 30 to 60 liters of water and from about 3 to 20 liters of glycerol.

4,463,019

STATIONARY PROCESS FOR PRODUCING VINEGAR

Akira Okuhara, Kashiwa; Yasuyosi Kotaka; Masakazu Nishio, both of Noda; Susumu Sato, Tsuchiura; Isamu Watanabe, and Masaru Inoue, both of Noda, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Jun. 5, 1981, Ser. No. 270,863
Claims priority, application Japan, Jun. 11, 1980, 55-77723
Int. Cl.³ C12J *1/00*; C12P *7/54*
U.S. Cl. 426—17 **4 Claims**



1. A stationary acetic acid fermentation process for the production of vinegar comprising charging a starting mash into a closed type fermentation tank and fermenting said mash as a stationary culture with acetic acid bacteria at an effective temperature to produce a high yield of vinegar, said fermentation carried out while maintaining the oxygen concentration and the gas phase of said fermentation tank in the range of 20–60% (V/V) by supplying sufficient gas containing a high concentration of oxygen into the upper space of said fermentation tank, said gas selected from the group consisting of pure oxygen and pure oxygen mixed with air.

4,463,020

YEAST-RAISABLE WHEAT-BASED FOOD PRODUCTS THAT EXHIBIT REDUCED DETERIORATION IN PALATABILITY UPON EXPOSURE TO MICROWAVE ENERGY

Ray Ottenberg, Washington, D.C., assignor to Lee Ottenberg, Bethesda, Md., a part interest

Filed Aug. 12, 1982, Ser. No. 407,621
Int. Cl.³ A21D *8/00, 13/00*
U.S. Cl. 426—19 **28 Claims**

10. A method of making a yeast-raised wheat-based food product comprising the steps of:

preparing a formulation comprising wheat flour, yeast, and an effective amount of rice flour to reduce deterioration in the palatability of the food product upon heating by microwave energy;

mixing the formulation into a dough; and

baking the dough formulation for a time and at a temperature sufficient to form a yeast-raised wheat-based food product; and

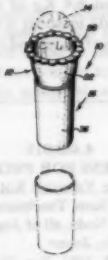
heating the food product by exposing it to microwave energy.

4,463,021

PIZZA CONE WITH FILLING

Joseph C. Eufemia, 318 Reichelt Rd., New Milford, N.J. 07646

Filed Mar. 31, 1983, Ser. No. 480,765
Int. Cl.³ A21D *13/00*
U.S. Cl. 426—90 **2 Claims**



1. A handheld edible food product comprising an edible receptacle having an open upper end and a downwardly extending peripheral wall terminating in a closed lower end, said receptacle being unitarily constructed of edible material, and a pizza filling in the receptacle, extending at least to the open upper end thereof to enable the receptacle and the filling therein to be handheld and consumed, said wall tapering downwardly to form a pizza cone, and an insulating cup of foam plastic telescoped over and supported by the external surface of at least the lower portion of the pizza cone to protect the hand of the person holding the cone from discomfort or injury due to burning, to stabilize the structural integrity of the cone and to catch and retain any liquid leakage through the cone, said pizza cone including a plurality of radially extending ribs in the lower end portion to engage the pizza filling to stabilize it and tend to hold it away from the wall of the cone, said pizza cone including an internal, inverted inner cone having a downwardly and outwardly tapering wall supported from said pizza cone with the upper end of the inner cone having a closed end for supporting and stabilizing the pizza filling, the upper end of said inner cone including a concave top wall for receiving and positioning said filling, said pizza cone wall including an outwardly bellied upper end portion defining an inwardly facing concave surface for increasing the capacity of the cone and rigidifying the upper end thereof, the upper end of said inner cone being disposed above the lower end of the bellied upper end portion of the pizza cone, said insulating cup terminating at the juncture between the upper end portion and the lower end portion of the pizza cone to enable consumption of the upper end portion of the cone and the pizza filling therein without interference, said ribs terminating at the juncture between the upper and lower end portions of the pizza cone for reinforcing the area of the pizza cone on which grasping forces are exerted when holding the cone.

4,463,022

METHOD OF GRINDING AND COOKING WHOLE GRAIN

Mark H. Sterner, 11661 Capitol St., Riverside, Calif. 92503, and Ronald O. Zane, 5533 Wentworth Dr., Riverside, Calif. 92505

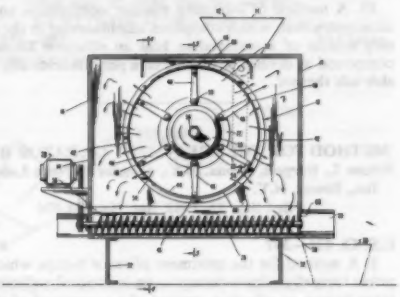
Continuation-in-part of Ser. No. 123,977, Feb. 25, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 321,907
Int. Cl.³ B02B *17/00*; A23P *1/00*; A23L *1/27*
U.S. Cl. 426—262 **19 Claims**

1. A method of grinding and cooking whole grain continuously in a grinding chamber separated by a screen from an outer chamber entirely containing the grinding chamber, comprising the following steps:

(a) introducing whole grain having a moisture content of 10–15% into the grinding chamber while blocking the ingress of air into the grinding chamber;

(b) impacting and thus crushing the grain in the grinding chamber thereby producing an atmosphere of hot moist air derived from the grain itself and forcing the crushed grain particles to pass along with the hot moist air through the screen into the outer chamber;

(c) allowing the particles of crushed grain in the outer chamber to fall into the lower portion of the outer chamber;



(d) recirculating the hot moist air from the outer chamber into the grinding chamber;

(e) maintaining the temperature and humidity of the recirculating air at a temperature sufficient to cook the grain during its residence in the grinding chamber; and

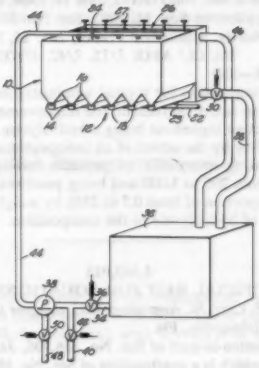
(f) removing the collected cooked crushed grain particles from the outer chamber while blocking the ingress of air.

4,463,023

METHOD FOR PRODUCING BLACK RIPE OLIVES

Kenneth C. McCorkle, Visalia; Horace M. Wells, Porterville; Hershell D. Scrimshire, Farmerville, and Robert N. Beckwith, Dinuba, all of Calif., assignors to Early California Foods, Inc., Visalia, Calif.

Continuation of Ser. No. 197,390, Oct. 16, 1980, abandoned. This application Jan. 6, 1982, Ser. No. 337,358
Int. Cl.³ A23B *7/00*; A23L *1/27*
U.S. Cl. 426—270 **7 Claims**



1. A method for producing black ripe olives from olives selected from the group consisting of fresh olives and brine stored olives, comprising:

introducing an alkaline solution, having a concentration of from about 0.45% to about 0.7% by weight for fresh olives and from about 0.9% to about 1.2% by weight for brine stored olives, into a unitary processing tank containing olives to a level which covers the olives in the tank,

said processing tank having an open top and a bottom made up of a plurality of corrugations, said corrugations forming a plurality of peaks and valleys extending across said bottom, each valley containing a plurality of spaced-apart holes along the length of said valley;

rapidly agitating the olives by bubbling air through said spaced-apart holes thus forming a plurality of generally circular flows of olives in the processing tank, each one of said flows above each of said valleys;

draining the processing tank of the alkaline solution after a first preselected period of time of between about 4 and 5 minutes so that the olives are exposed to air;

exposing the olives to air, without rinsing, for a second preselected period of time which along with the first preselected period of time totals about one-half hour; and

repeating the introducing, draining and exposing steps for a period of time sufficient to achieve a desired oxidation ring in the olives.

4,463,024

FLAVORING MATERIAL AND PROCESS FOR PRODUCING DRINKS AND FOODS EXCELLENT IN FLAVOR

Yoshihiko Nishizawa, Noda; Taihei Takezawa, Eazan, and Takashi Shinohara, Kashiwa, all of Japan, assignors to Kikkoman Corporation, Noda and Mann's Wine Co., Ltd., Tokyo, both of, Japan

Filed Jan. 19, 1982, Ser. No. 340,893

Claims priority, application Japan, Jan. 27, 1981, 56-9728; Jan. 28, 1981, 56-10266

Int. Cl.³ A23L *1/221, 1/28*

U.S. Cl. 426—533 **10 Claims**

1. A flavoring material comprising a flavoring wooden material obtained by treating a wooden raw material selected from the group consisting of raw white oak and raw Japanese oak with pressure and heat for 30 seconds or longer in the presence of a saturated steam having a pressure of 4 to 15 $kg/cm^2.G$ or a super-heated steam having a temperature of 164° to 300° C. and thereafter rapidly or slowly discharging said pressure and heat-treated wooden raw material into an atmosphere having a lower pressure.

4,463,025

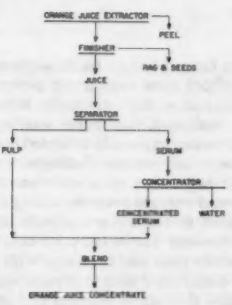
PROCESS FOR PREPARING A CITRUS FRUIT JUICE CONCENTRATE

Rudolf G. K. Strobel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 171,056, Jul. 22, 1980, abandoned. This application Jul. 16, 1981, Ser. No. 283,762

Int. Cl.³ A23L *2/12, 2/14*

U.S. Cl. 426—599 **30 Claims**



1. A process for making a natural citrus fruit juice concentrate product which comprises:

(1) extracting fruit juice from fruit, said fruit juice comprising a particulate solids portion and a serum portion;

(2) passing said juice directly to a separating zone having an inert atmosphere wherein said particulate solids portion is separated and recovered, thereby forming a serum portion comprising about 7% to about 20% non-aqueous compounds, and about 80% to 93% water;

(3) passing said serum portion containing non-aqueous compounds less than 80 microns in size to a freeze concentrating zone comprising an adiabatic recrystallizer wherein, under an inert atmosphere, substantially pure ice crystals are formed and recovered without removing substantial amounts of solids, whereby a concentrated fruit juice is formed comprising from about 20% to about 52% solids and from about 48% to about 80% water;

(4) pasteurizing said concentrated fruit juice by heating in a closed system to a temperature in the range of about 80° C. to about 95° C. for from about 3 to about 15 seconds whereby microorganisms and enzymes present are substantially inactivated;

thereby producing a natural citrus fruit juice concentrate product comprising:

(A) substantially 100% of the nonvolatile compounds originally present in the solids portion of said serum;

(B) at least 65% of the volatile compounds originally present in the solids portion of said serum.

4,463,026

MEAT CURING BRINE

William S. Chandler, St. Clair; Walter F. Wilkens, Marysville, and John F. Heiss, St. Clair, all of Mich., assignors to Diamond Crystal Salt Company, St. Clair, Mich.

Division of Ser. No. 358,629, Mar. 16, 1982, Pat. No. 4,434,187. This application Jan. 25, 1984, Ser. No. 559,479

Int. Cl.³ A23B *4/02, 4/14*

U.S. Cl. 426—652 **16 Claims**

1. A curing brine suitable for a wet curing or pumping of meat products comprising an aqueous solution containing a controlled amount of a curing constituent dissolved therein including a salt, selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof, water insoluble finely particulated amorphous, tocopherol absorbent porous silica particles and a controlled amount of dl-alpha-tocopherol distributed on and absorbed in said particles and uniformly dispersed through said aqueous solution.

4,463,027

METHOD OF FORMING A MEAT CURING BRINE

William S. Chandler, St. Clair; Walter F. Wilkens, Marysville, and John F. Heiss, St. Clair, all of Mich., assignors to Diamond Crystal Salt Company, St. Clair, Mich.

Division of Ser. No. 358,629, Mar. 16, 1982, Pat. No. 4,434,187. This application Jan. 25, 1984, Ser. No. 559,481

Int. Cl.³ A23B *4/02, 4/14*

U.S. Cl. 426—652 **14 Claims**

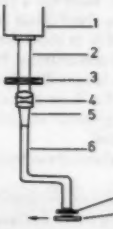
1. The method of forming a substantially stable aqueous curing brine suitable for wet curing or pumping of meat products in which a controlled amount of dl-alpha-tocopherol is substantially uniformly dispersed therethrough comprising the steps of dissolving and dispersing in an aqueous medium a substantially uniform free-flowing particulated composition consisting essentially of controlled amounts of at least one water soluble finely particulated curing constituent, finely particulated water insoluble amorphous, tocopherol absorbent porous silica particles and dl-alpha-tocopherol distributed substantially uniformly on the particles of said curing constituent and distributed on and absorbed in said silica particles.

4,463,028

METHOD FOR PREPARING COMPOSITE OR ELEMENTARY SEMI-CONDUCTING POLYCRYSTALLINE FILMS

Lucien D. Laude, Hautmont, France, assignor to L'Etat Belge, Représenté par le Secrétaire Général des Services de la Programmation de la Politique Scientifique, Brussels, Belgium

Filed Aug. 3, 1981, Ser. No. 289,695
Claims priority, application Luxembourg, Aug. 5, 1980, 82690; Jul. 14, 1981, 83490
Int. Cl.³ B05D 5/12
U.S. Cl. 427—53.1 29 Claims



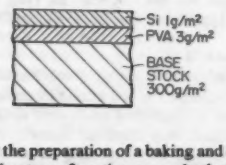
1. Method for preparing polycrystalline semi-conducting films comprised of two elements from Groups III and V, respectively, or Groups II and VI, respectively, of the Periodic Table, by irradiating with a laser beam a film, said film being comprised of at least two layers each of which is formed from one of said elements selected in a stoichiometric ratio, said film being deposited over a non-crystalline substrate and being coated with a protective layer, which method is comprised of irradiating said film with a structured laser beam to cause crystallizing of said elements into crystallites which are regularly aligned and which have a size at least equal to the thickness of the resulting film, wherein said laser beam is structured by passing the beam through an optical means which is so arranged as to cause interference fringes.

4,463,029

BAKING AND COOKING TRAY SHEET AND ITS MANUFACTURING METHOD

Masayuki Nishijima, Tokorozawa; Morimasa Koizumi, Yokohama, and Minoru Matsuda, Komatsushima, all of Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Division of Ser. No. 296,303, Aug. 26, 1981. This application Jun. 7, 1982, Ser. No. 386,019
Claims priority, application Japan, Sep. 20, 1980, 55-120606
Int. Cl.³ B05D 3/02
U.S. Cl. 427—209 1 Claim



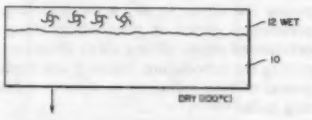
1. A method for the preparation of a baking and cooking tray sheet comprising the steps of coating one or both sides of a base stock of neutral paper or cardboard weighing 150 to 500 g/m² on the dry basis with a coating liquid consisting essentially of a polyvinyl alcohol and/or starch and a water-resisting agent, followed by drying, and of applying the coated side of the resultant sheet with a coating liquid of silicone resin, followed by drying.

4,463,030

PROCESS FOR FORMING NOVEL SILVER POWDER COMPOSITION

Robert J. Deffeyes, Arlington, and Harris W. Armstrong, Ft. Worth, both of Tex., assignors to Graham Magnetics Incorporated, North Richland Hills, Tex.

Division of Ser. No. 062,016, Jul. 30, 1979, Pat. No. 4,289,534, which is a division of Ser. No. 793,384, May 3, 1977, Pat. No. 4,186,244. This application Dec. 24, 1980, Ser. No. 485,431
Int. Cl.³ B05D 7/00; C09D 5/24
U.S. Cl. 427—216 11 Claims



1. A process for making a metal powder product comprising the steps of:

(a) mixing an organometallic salt of a metal and a carboxylic acid in a liquid organic reactant; and, simultaneously

(b) decomposing said salt to form a metal powder in the presence of said reactant; and

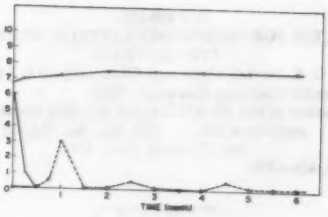
(c) forming a protective barrier about newly formed particles of said metal powder by reacting said organic reactant with newly formed particles of said metal powder.

4,463,031

PROCESS FOR PREPARING A BACTERIOLOGICAL INHIBITOR FOR WATER

Nobuo Someya, 16-6, Kami-Ikebukuro 3-chome, Toshima-ku, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 428,505
Int. Cl.³ B01D 23/16; B05D 7/00
U.S. Cl. 427—217 9 Claims



1. A process for preparing a bacteriological inhibitor comprising silver-plated coral sand which comprises heating desalted coral sand in an inert gas under reduced pressure to activate said coral sand; thoroughly washing said activated coral sand with water to provide activated coral sand substantially free of nitric acid radicals; soaking so washed coral sand in a nitric acid radical-free silver-ammonia complex solution with heating under reduced pressure, adding a trace amount of a reducing agent to said silver-ammonia complex solution, maintaining the soaked state of said coral sand for a time period required to thereby plate said coral sand with silver; evaporating said silver-plated coral sand to dryness with heating under reduced pressure; thoroughly w ashing said silver-plated coral sand with water, and then dryi..g said silver-plated coral sand to provide a substantially nitric acid radical-free bacteriological inhibitor.

4,463,032

METHOD FOR MAKING BLOCK-RESISTANT SOFT POLYMER BEADS

Peter J. Arndt, Seeheim-Jugenheim; Werner Siol, Darmstadt; Walter Ludwig, Bensheim, and Franz Wenzel, Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,406
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3150730
Int. Cl.³ B05D 7/00; C12P 33/14, 33/08
U.S. Cl. 427—222 14 Claims

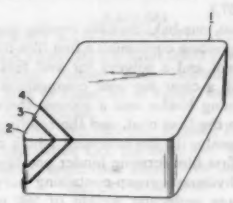
1. A method for treating beads consisting essentially of a core of a first, softer, acrylic polymer prepared by a bead polymerization process and having a glass transition temperature below 70° C. to render such beads non-blocking, which method proceeds in the absence of a foaming agent and comprises depositing an adherent film of a second, harder, film forming polymer onto said beads from a dispersion of said second polymer, and then drying the treated beads, said second, harder, film forming polymer having a glass transition temperature which is at least 10° C. higher than that of said first, softer, polymer.

4,463,033

PROCESS FOR PRODUCTION OF COATED SUPER-HARD ALLOY ARTICLES

Noribumi Kikuchi, Omiya; Yasuo Suzuki, Ageo; Taijiro Onishi, and Fumio Washizu, both of Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 9,737, Feb. 5, 1979, Pat. No. 4,341,834, which is a continuation of Ser. No. 813,774, Jul. 7, 1977, abandoned. This application Jul. 17, 1981, Ser. No. 284,561
Claims priority, application Japan, Jul. 10, 1976, 51-82261
Int. Cl.³ C23C 11/00, 13/00
U.S. Cl. 427—255.3 6 Claims



5. A process for producing a super-hard alloy article which comprises:

forming a substrate of a super-hard alloy comprising at least one member selected from the group consisting of carbides, nitrides and carbonitrides of metals of Groups 4*a*, 5*a* and 6*a* of the periodic table and at least one member selected from the group consisting of Fe, Ni, Co, W, Mo and Cr;

forming on the surface of the substrate an inner layer of a thickness of 0.5 to 20 microns of at least one member selected from the group consisting of titanium carbide, titanium nitride, and titanium carbonitride;

reacting, in the presence of the substrate having the inner layer thereon, a halide of titanium with hydrogen and a member selected from the group consisting of carbon monoxide, carbon dioxide, and mixtures of carbon monoxide and carbon dioxide at a temperature of 800° to 1,200° C. in a gaseous phase to deposit a titanium oxycarbide, produced by the reaction, from the gaseous phase onto the inner layer and thus form an intermediate layer of a thickness of 0.5 to 10 microns of the titanium oxycarbide on the inner layer; and

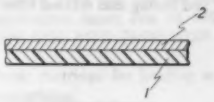
forming an outer coating layer of a thickness of 0.5 to 10 microns of aluminum oxide on the outer surface of the intermediate layer.

4,463,034

HEAT-SENSITIVE MAGNETIC TRANSFER ELEMENT

Yukio Tokunaga; Yasuhisa Ikeda, both of Yokosuka; Tadao Seto, Matsudo, and Yoshikazu Shimazaki, Osaka, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Tokyo and Fuji Kagakushi Kogyo Co., Ltd., Osaka, both of, Japan

Filed Mar. 15, 1982, Ser. No. 358,033
Claims priority, application Japan, Apr. 21, 1981, 56-60961
Int. Cl.³ B41M 5/26
U.S. Cl. 427—256 6 Claims



1. A process for printing a magnetic image to be recognized by a magnetic ink character reader on a receiving medium, which comprises the steps of:

providing a heat-sensitive magnetic transfer element comprising a heat-resisting foundation and a heat-sensitive transferring layer provided on the foundation, said transferring layer comprising a ferromagnetic substance powder and a binder material, the amount of the ferromagnetic substance powder being from 30 to 97% by weight per the total amount of the transferring layer, the binder material consisting essentially of a member selected from the group consisting of a wax and a mixture of a wax and a thermoplastic resin, and the transferring layer having a melting temperature of 50° to 120° C.;

superimposing the transfer element over a receiving medium so that the transferring layer of the element is brought to come into contact with the receiving medium; and

applying the heat from a thermal head of a thermal printer to the transfer element whereby the portions of the transferring layer corresponding to the areas heated with the thermal head were melted and transferred onto the receiving medium to give a magnetic image.

4,463,035

PROCESS FOR IMPARTING LUBRICITY TO FIBERFILL FIBER

George H. Greene, Croton-on-Hudson, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

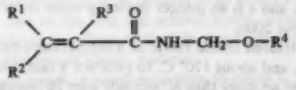
Filed Dec. 29, 1982, Ser. No. 454,335
Int. Cl.³ B05D 3/02
U.S. Cl. 427—389.9 14 Claims

1. A process to impart lubricity to fibers which comprises:

(a) treating said fibers with a neat composition, solution or dispersion containing:

(i) from about 0.001% to about 2% by solution weight or neat composition weight of an acid catalyst,

(ii) at least about 0.5% by solution weight or neat composition weight of a graft copolymer prepared by grafting to a poly(oxyalkylene) from about 0.5% to about 50% by polymer weight of an N-(oxymethyl) acrylamide of the formula:



wherein one or more R^1, R^2, R^3, and R^4 are hydrogen or monovalent hydrocarbon radicals containing from 1

to about 6 carbon atoms each and the poly(oxyalkylene) is of the formula:

$$R^5[(OC_nH_{2n})_zXR^6]_a$$

wherein R^5 is a hydrocarbon radical having a valence of a and containing up to about 21 carbon atoms, a is an integers having values between 1 and 4, X is an oxygen, nitrogen or sulfur atom, R^6 is a hydrogen atom or hydrocarbon radical containing up to about 6 carbon atoms and may contain hydroxyl, amino or mercaptyl groups, n is an integer from 2 to 4 and z is an integer having a value from about 2 to about 800, and

(b) drying and curing said treated fiber.

4,463,036

PROCESS FOR IMPARTING HYDROPHILICITY TO FABRIC

George E. Totten, West Haverstraw, and Angelo J. Sabia, Yorktown, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

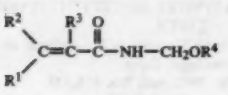
Filed Dec. 29, 1982, Ser. No. 454,361
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—389.9 5 Claims

1. A process to impart durable hydrophilicity to fabric which comprises:

(a) treating a polyester fabric with a neat composition, solution or dispersion containing:

(i) at least about 0.001% by solution weight or neat composition weight of an acid catalyst selected from the group consisting of p-toluene sulfonic acid and zinc fluoroborate, and

(ii) from about 0.1% to about 5% by solution weight or neat composition weight of a graft copolymer prepared by grafting to a poly(oxyalkylene) from about 0.5% to about 50% by graft copolymer weight of an N-(oxymethyl)-acrylamide having the formula:



wherein R^1, R^2, R^3 and R^4 are hydrogen or monovalent hydrocarbon radicals containing from 1 to 6 carbon atoms each and may be the same or different to a poly(oxyalkylene) of the formula:

$$R^5[(OC_2H_4)_x(OC_3H_6)_yOR^6]_z$$

wherein R^5 is a hydrocarbon radical having a valence of a and containing up to about 21 carbon atoms, a is an integer having a value between 1 and 4, R^6 is a hydrogen atom or hydrocarbon radical containing up to about 6 carbon atoms and x is an integer having a value from about 2 to about 5000, and z is an integer having a value from about zero to about 5000;

(b) drying said treated textile fabric at a temperature between about 100° C. and about 170° C. to produce a fabric having a wettability of no more than 40 seconds after 20 launderings in accordance with AATCC Test Methods 39-1977 and 130-1977, respectively.

4,463,037

PROCESS FOR THE USE OF OLIGOMER AS FIBER SURFACE TREATING AGENT

Bryce C. Oxenrider, Florham Park, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 380,188, May 20, 1982. This application Dec. 1, 1983, Ser. No. 556,817
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—389.9 7 Claims

1. A method of treating a polyamide or polyester fiber which comprises:

(I) applying to the fiber an oligomer-containing mixture formed by a process of:

(a) reacting pyromellitic dianhydride with fluorinated alcohol at a mole ratio of fluorinated alcohol to pyromellitic dianhydride between about 1:0.6 and about 1:0.85 to form a partially esterified product having fluorinated ester groups, free acid groups and anhydride groups; and

(b) reacting the partially esterfied product with an oxirane compound selected from the group consisting of epichlorohydrin, epibromohydrin and propylene oxide in an amount sufficient to cause essentially all of the free acid groups and anhydride groups to be esterified

(II) Annealing the treated fiber at a temperature between about 80° C. and about 160° C.

4,463,038

METALLIC COATING USING TWO COAT ONE BAKE METHOD

Kunihiko Takeuchi, Minoo, and Hidefumi Okuda, Toyonaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Sep. 28, 1982, Ser. No. 425,349
Claims priority, application Japan, Nov. 2, 1981, 56-176213
Int. Cl.³ B05D *3/02*
U.S. Cl. 427—407.1 8 Claims

1. In a two-coat, one-bake metallic coating method wherein a base coat composition containing a first film-forming binder, a metallic pigment and a solvent for said first film-forming binder is applied, a clear top coat composition containing a second film-forming binder and a solvent thereof is applied wet-on-wet onto the base coat, and the resulting multicoat is cured simultaneously, the improvement which comprises employing as said first film-forming binder one consisting essentially of (a) a hydroxyl group-containing acrylic oligomer having an average molecular weight of 500 to 2000, (b) a non-yellowing polyisocyanate in an NCO—OH ratio of 0.5/1 to 1/0.5 relative to said acrylic oligomer, or a combination thereof with up to 30 percent by weight of the polyol (as non-volatile solids) of a melamine resin; and (c) a film-forming cellulose derivative; and as said second film-forming binder one consisting essentially of an acrylic oligomer as defined hereinabove, and a polyisocyanate as defined hereinabove, in an NCO/OH ratio of 0.5/1 to 1/0.5 relative to said acrylic oligomer, of a combination thereof with up to 30 percent by weight of the polyol (as non-volatile solids) of a melamine resin.

4,463,039

SPRAYABLE ACOUSTICAL COMPOSITION

Daniel D. O'Connell, Crystal Lake, Ill., and Thomas A. Broz, Willoughby, Ohio, assignors to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 337,546, Jan. 6, 1982, abandoned. This application Jun. 13, 1983, Ser. No. 503,071
Int. Cl.³ B05D *1/02, 5/00*
U.S. Cl. 427—421 5 Claims

1. A method for forming a monolithic, acoustical, textured surface comprising mixing mineral wool, polyolefin fibers, a binder selected from the class consisting of starch, polyvinyl acetate, polyvinyl alcohol and mixtures thereof, a foaming

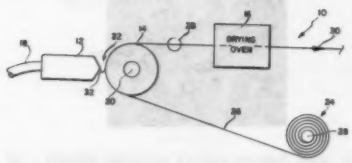
agent and water to form a foamy composition, confining said composition under super-atmospheric pressure, releasing it through a nozzle to form a stream, introducing a compressed gas into said stream to atomize the composition, and directing said atomized composition against a substrate.

4,463,040

COATING-BEAD STABILIZATION APPARATUS

Semyon Kisler, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1982, Ser. No. 454,143
Int. Cl.³ B05D *1/00*
U.S. Cl. 427—445 **13 Claims**



8. A method of controlling objectionable vibrations occurring in coating material flowing from a coating applicator to the surface of a moving web spaced from said applicator, said method comprising the steps of:

sensing the amplitude and frequency of any mechanical vibrations of said coating applicator;

applying a source of mechanical vibrations to said applicator; and

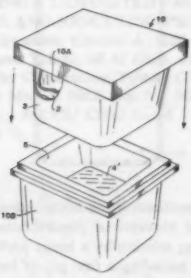
adjusting the amplitude, frequency or phase characteristics of said source of mechanical vibration while monitoring the vibration amplitude of said coating applicator to reduce said applicator vibrations.

4,463,041

LIGHTWEIGHT AND DIMENSIONALLY ACCURATE RESIN CONCRETE MOLDED PRODUCTS

Koyanagi Takuji, Nabari; Ono Nobuhiro, and Kitamura Hiroyuki, both of Ueno, all of Japan, assignors to Ina Seito Co., Ltd., Aichi, Japan

Division of Ser. No. 193,727, Oct. 3, 1980, Pat. No. 4,382,055. This application Oct. 22, 1981, Ser. No. 313,973
Claims priority, application Japan, Feb. 21, 1980, 55-021276
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—35 **8 Claims**



1. A lightweight and highly dimensionally accurate molded resin concrete product essentially comprising:

an intermediate layer composed of resin concrete comprising a synthetic resin and inorganic filler and having a resin content of about 10 to 70%, said intermediate layer having a thickness which is more than 5 mm and not greater than 20/1,000 of its maximum length; and

a reinforcing layer having appropriate thickness sufficient to constrain said intermediate layer formed on each of the opposite surfaces of said intermediate layer, and composed of a fiber reinforced plastic.

4,463,042

CARTRIDGE

Hirotomo Fujiwara, and Yoshio Hara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1982, Ser. No. 389,184
Claims priority, application Japan, Jun. 16, 1981, 56-92560
Int. Cl.³ G09F *3/00*; B65D *79/00*; B32B *3/14*
U.S. Cl. 428—35 **12 Claims**

1. A polymer plastic cartridge for holding an information recording means, comprising:

a polymer plastic container; and

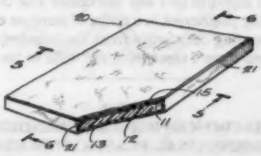
a writing quality-imparting layer embedded on a surface of the container, wherein the writing quality-imparting layer is formed from a liquid printing composition comprising a, filler material having a size of 0.1 to 10μ in an amount of 0.5 to 5 grams per 100 grams of the liquid composition, a hydrophilic polymer selected from the group consisting of cellulose ether, polyvinyl alcohol and gelatine and present in an amount of from 2 to 10 grams per 100 grams of the liquid composition, and a polymer plastic of the same type of which the container is comprised and present in an amount of from 0.1 to 2 grams per 100 grams of the liquid compostion.

4,463,043

BUILDING PANEL

John F. Reeves, and Clarence O. Wahner, both of Brown Deer, Wis., assignors to Sprinkmann Sons Corporation, Milwaukee, Wis.

Filed Aug. 26, 1981, Ser. No. 296,275
Int. Cl.³ B32B *1/00, 3/00, 27/04, 27/42*
U.S. Cl. 428—68 **8 Claims**



1. A building panel comprising, in combination:

(1) spaced first and second layers, each consisting of furan resin reinforced with glass fiber material and each having an exposed exterior surface;

(2) a connecting member arranged between the spaced first and second layers and joined to each of said layers; and

(3) a covering layer bonded to an exterior surface of at least one of the first and second layers, wherein the covering layer is a sheet of flexible plastic film or a sheet of rigid thermoset plastic material.

5. A building panel according to claim 1, 2, 3 or 4 wherein: the connecting member is a body of plastic foam or glass foam insulating material.

4,463,044

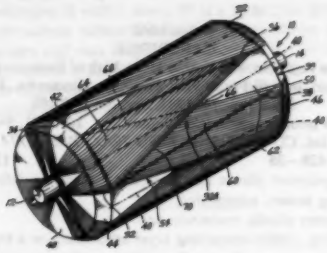
COMPOSITE PANEL OF VARIED THICKNESS

Maurice E. McKinney, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 306,340, Sep. 28, 1981, Pat. No. 4,401,495. This application Aug. 5, 1982, Ser. No. 405,686

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—107 **7 Claims**



1. A composite panel having varied thicknesses, said panel being constructed by a process comprising:

polar winding impregnated plies on each side of a multisided mandrel; each side having a narrow end and a wide end;

winding each ply at a first angle with respect to the axis of the mandrel and center line of each side so that the ply on each side is wound to incompletely cover the side;

polar winding plies at a second angle approximately equal to the first angle and at an opposite crossing direction on each side of the mandrel to cross the plies at the first angle so that the plies at both angles are wound to incompletely cover the side to form a set of crossing plies;

the polar windings at the first and second angles being started at said wide end of each side and extended toward the narrow end of each side, the plies at the second angle overlapping the first;

the overlapping windings most remote from the wide end form a first V on each side;

the space within the first V on each side being not covered by the respective windings forming the first V; and

continuing polar winding plies at selected angles over the plies wound to form the first V so as to form successive sets of crossing plies forming successive V's opening toward the narrow end, the apexes of the V's being directed toward the wide end and being generally formed along the mandrel axis and the center line of the side;

said V's being positioned in a series of steps on each side, the steps extending outwardly from the mandrel and so as to decline and form a taper from the wide to the narrow end.

4,463,045

MACROSCOPICALLY EXPANDED THREE-DIMENSIONAL PLASTIC WEB EXHIBITING NON-GLOSSY VISIBLE SURFACE AND CLOTH-LIKE TACTILE IMPRESSION

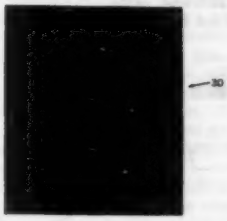
Nicholas A. Ahr; Paul R. Louis; William I. Mullane, Jr., and William R. Ouellette, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 239,875, Mar. 2, 1981, abandoned. This application Feb. 16, 1982, Ser. No. 349,098

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—131 **9 Claims**

1. A macroscopically expanded three-dimensional plastic web having at least one visible surface which appears substantially non-glossy when exposed to light, substantially all of said visible surface exhibiting a regularly spaced, microscopic pattern of discrete surface aberrations, each of said surface aberrations having its amplitude oriented perpendicular to the surface in which said surface aberration originates, each of said surface aberrations having a maximum dimension of less than about 6 mils, as measured in a plane oriented substantially perpendicular to its amplitude, whereby said surface aberrations are not discernible to the normal naked eye when the perpendicular distance between the viewer's eye and the plane of said web is at lest about 12 inches, each of said surface aberrations also being free of planar areas which are large enough to inscribe a 4 mil diameter circle and so spaced relative to all adjacent



surface aberrations that the maximum diameter of any circle which can be inscribed on any planar surface intermediate said surface aberration and said adjacent surface aberrations on any portion of said visible surface is less than about 4 mils, whereby any light incident upon any portion of said visible surface is diffusely reflected into a multiplicity of directions by said surface aberrations so that said visible surface appears substantially non-glossy.

4,463,046

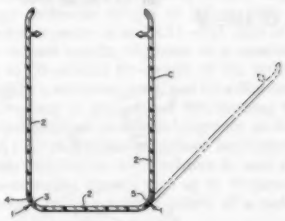
SYNTHETIC RESIN PANELS JOINED BY AN INTEGRAL HINGE HAVING DUAL DUROMETER PLIES

Herbert L. Hutchison, Whitehall, and Byron W. Rose, Williamsport, both of Ohio, assignors to Crane Plastics, Inc., Columbus, Ohio

Filed Oct. 11, 1983, Ser. No. 540,336

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—156 **3 Claims**



1. An integral synthetic resin body comprising at least two substantially rigid sections of predetermined hardness connected in adjoining relation by a hinge section, the hinge section of said body including a first ply of lesser thickness than said rigid sections but having the same hardness and composition as said rigid sections, and a second ply overlying and integrally formed with the first ply of said hinge section, but having a hardness substantially less than said rigid sections and the first ply of said hinge section.

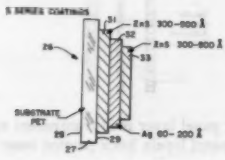
2. A synthetic resin body according to claim 1, wherein the surface of said first ply opposite said second ply is formed with a longitudinal groove defining a weakened, fracture line in said first ply.

4,463,047

FLEXIBLE SELECTIVE ENERGY CONTROL SHEET AND ASSEMBLY USING THE SAME

John S. Matteucci, Healdsburg; James K. Snyder, and Robert E. Hahn, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Oct. 2, 1981, Ser. No. 308,025
Int. Cl.³ B32B *15/04*
U.S. Cl. 428—216 9 Claims



1. In a flexible selective energy control sheet, a sheet of substantially transparent flexible polymer thin film plastic material having first and second surfaces, an optically active substantially transparent adhesion promoting layer adherent to said second surface of said sheet, said adhesion promoting layer being substantially continuous, a substantially transparent metal layer adherent to said adhesion promoting layer and a protective layer adherent to said metal layer, said metal layer being formed of silver and having a thickness ranging from 60 to 200 Angstroms, said adhesion promoting layer and said protective layer being formed of zinc sulfide and having a thickness ranging from 300 to 500 Angstroms.

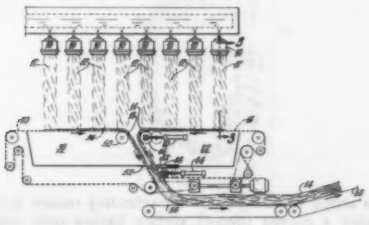
5. In a flexible selective energy control sheet, a sheet of substantially transparent flexible polymer thin film plastic material having first and second surfaces, an optically active substantially transparent adhesion promoting layer adherent to said second surface of said sheet, said adhesion promoting layer being substantially continuous, a substantially transparent metal layer adherent to said adhesion promoting layer and a protective layer adherent to said metal layer, said metal layer being formed of copper having a thickness ranging from 100 to 500 Angstroms, said adhesion promoting layer and said protective layer being formed of chromium and having a thickness ranging from 10 to 200 Angstroms.

4,463,048

MANUFACTURING A LAMINATED PACK OF MINERAL FIBERS AND RESULTING PRODUCT

Lyle C. Dickson, Swanton; Chester A. Hall, Jr., Sylvania, and Arthur B. Havens, Toledo, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 4, 1982, Ser. No. 354,575
Int. Cl.³ C03B *37/04*
U.S. Cl. 428—218 16 Claims



8. The method for producing a laminated pack of mineral fibers comprising

(a) Successively depositing mineral fibers from a plurality of sources of mineral fibers onto a first forming conveyor to form a first layer of mineral fibers, and providing suction to said mineral fibers through said first forming conveyor, the suction being sufficient to force substantially all of the mineral fibers downwardly onto the first forming conveyor, thereby crushing the bottom portion of said first layer and forming a first bottom surface on said first layer which is smooth relative to the top surface of said first layer;

(b) successively depositing mineral fibers from a plurality of sources of mineral fibers onto a second forming conveyor to form a second layer of mineral fibers, providing suction to said mineral fibers through said second forming conveyor, the suction being sufficient to force substantially all of the mineral fibers downwardly onto the second forming conveyor, thereby crushing the bottom portion of said second layer and forming a second bottom surface on said second layer which is smooth relative to the top surface of said second layer, and changing the path of said second layer to a generally downward direction while maintaining the suction on said second layer; and

(c) joining said top surfaces of said first and second layers to produce a laminated pack having as its outer surfaces said first and second bottom surfaces.

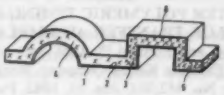
12. A mineral fiber insulation pack made by the method of claim 8.

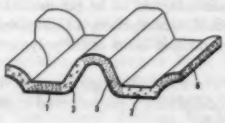
4,463,049

SOUND-ABSORBING WALL-LINING

Wilhelm Kracke, Celle, Fed. Rep. of Germany, assignor to Dr. Alois Stankiewicz Schallschluck GmbH & Co., Fed. Rep. of Germany

Filed Jan. 17, 1983, Ser. No. 458,552
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 8201510[U]
Int. Cl.³ E04B *1/84, 1/86;* G10K *11/00*
U.S. Cl. 428—281 5 Claims





1. A sound insulating wall-lining having uniform thickness and locally distinctive sound insulating properties and comprising a resilient layer such as a foam or a felt containing a filler material and characterized by the fact that said locally distinctive sound insulating properties are caused by and correspond to locally distinctive degrees of chemical cross-linking in the filler material.

4,463,050

POLYURETHANE CATALYST SYSTEM ADDITIVE WHICH PERMITS THE USE OF RELATIVELY "COLD" MOLDS

Robert L. Zimmerman, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,588
Int. Cl.³ B29D *27/00*
U.S. Cl. 428—318.8 7 Claims

1. A method for producing a polyurethane without voids

within a "cold" mold which comprises reacting an organic polyisocyanate with an organic polyether polyol in the presence of a catalytic amount of an amine catalyst system of which about 10 to about 30 wt.% is an N-alkylmorpholine where the alkyl substituent has from one to four carbon atoms, within a mold having an average temperature of equal to or greater than 105° F. and less than 120° F.

4,463,051

PROCESS FOR TEMPERATURE MONITORING A SUBSTRATE

Dieter R. Berndt, Neptune, N.J., assignor to TRP Energy Sensors, Inc., New York, N.Y.

Filed Mar. 31, 1982, Ser. No. 363,913
Int. Cl.³ B32B *5/16*; C09D *11/00*
U.S. Cl. 428—323 **9 Claims**

1. A process for temperature monitoring a substrate to ascertain exposure to a thermal event of a predetermined temperature level, which comprises:

coating a portion of said substrate with a temperature-responsive composition exhibiting an irreversible visual color change once subjected to a temperature above the preselect temperature level and comprising a colloidal suspension of particles of a size greater than 5 microns and less than 20 microns of an essentially white, inorganic material in a water-based solution of a water soluble organic compound, said inorganic material having a melting point slightly below said predetermined temperature level.

4,463,052

VINYL-ESTER POLYMERIC TIMING LAYER FOR COLOR TRANSFER ASSEMBLAGES

David B. Bailey, and Edward P. Abel, both of Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 462,501, Jan. 31, 1983, Pat. No. 4,440,848.
This application Oct. 24, 1983, Ser. No. 546,242
Int. Cl.³ B32B *27/08*; G03C *1/40*
U.S. Cl. 428—424.4 **4 Claims**

1. A cover sheet adapted to be permeated by an alkaline processing composition comprising a transparent support having thereon a neutralizing layer and a polymeric timing layer comprising

(i) from about 1 to about 30 weight percent of a hydrophilic component comprising a polymerized monovinyl ester of a polybasic acid, and

(ii) the balance comprising a hydrophobic component comprising a polymerized alkyl vinyl ester and a polymerized aryl vinyl ester.

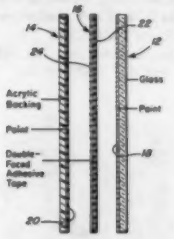
4,463,053

DECORATIVE PANELS AND METHOD OF MAKING SAME

Bette L. Brinegar, P.O. Box 523, Bloomington, Ind. 47402

Filed Apr. 11, 1983, Ser. No. 483,540
Int. Cl.³ B44F *1/06*
U.S. Cl. 428—442 **14 Claims**

1. In a decorative panel for use in buildings and the like, the panel having conforming first and second panel layers, and adhesive means securing the layers together to form a laminate, the improvement wherein said adhesive means comprises double-sided, pressure-sensitive adhesive tape with one surface adhered to an inner face of the first panel layer and the other surface adhered to an inner face of the second panel layer



wherein the first panel layer is of transparent material and at least one of the panel layers has a painted inner face.

4,463,054

PLASTIC-METAL LAMINATE, PROCESS, AND COMPOSITION

Wayne F. Nelson, Akron, Ohio, assignor to A. Schulman, Inc., Akron, Ohio

Filed Sep. 17, 1982, Ser. No. 419,129
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.
Int. Cl.³ B32B *15/08*; B05D *3/02*
U.S. Cl. 428—458 **18 Claims**

1. A plastic-metal laminate resistant to galvanic disbonding comprising a layer of metal bonding plastic material bonded to one side of a metal strip, in which said metal bonding plastic material comprises from about 60 to about 80 percent of a polymeric material and a balance of about 20 to about 40 percent of conductive carbon black, said polymeric material being selected from the group consisting of

(a) an ionomeric copolymer containing between about 25 to about 98.5 percent ethylenic units and between about 1.5 to about 30 percent carboxylic units, at least the major portion of which is in the free acid form, and

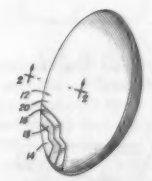
(b) a blend of said ionomeric copolymer and a compatible thermoplastic elastomer, said ionomeric copolymer being present in an amount effective to promote bonding between said metal and said metal bonding plastic material.

4,463,055

REFLECTIVE FILM AND METHOD OF APPLYING SAME

Marvin P. Hodges, 6162 Leeland Street S., St. Petersburg, Fla. 33715

Filed Apr. 27, 1983, Ser. No. 489,247
Int. Cl.³ B32B *15/08*
U.S. Cl. 428—458 **23 Claims**



1. An article of manufacture for reflecting radiant energy comprising a curved support surface having cold stretch bonded thereto a partially stretched laminate comprising an extensible, continuous metal foil secured to a polymeric film, said polymer film thicker than the foil and having an ultimate elongation greater than 30% an ultimate tensile strength not

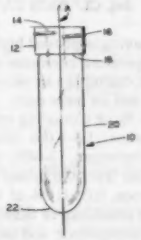
greater than 21,000 p.s.i., and an ultimate yield strength not greater than 8,000 p.s.i.

4,463,056

THERMOPLASTIC CONTAINER PARISON

Scott W. Steele, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 26, 1981, Ser. No. 314,642
Int. Cl.³ B65D *1/00, 85/70*
U.S. Cl. 428—542.8 **2 Claims**



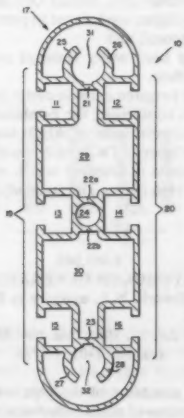
1. An injection molded thermoplastic parison comprising a tubular body portion having an open end and a closed end, said open end defined by a finish portion having a single helical thread extending less than 360° around the circumference of said finish, the radius of said parison from its central axis to a point on its outer surface being greatest through the crest of said thread and the radius of every other point on the outside surface of said parison being less than said greatest radius with each point further from said thread crest toward the closed end of said parison being greater than or equal to a more distant point from said thread crest.

4,463,057

EXTRUDED SECTION BAR MEMBER

Hans Knürr, Am Strassland 14, D-8011 Kirchheim, Fed. Rep. of Germany

Filed Aug. 20, 1982, Ser. No. 409,828
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1981, 3133457
Int. Cl.³ B21C *37/00*
U.S. Cl. 428—595 **19 Claims**



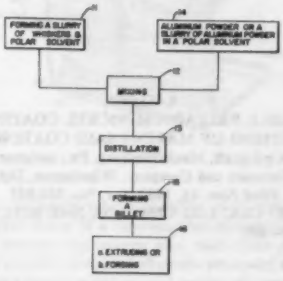
1. Extruded section bar member of metal for use as a vertical support in industrial and office furniture, characterized in that the bar member has in cross section a shape corresponding substantially to an elongated rectangle of which the short sides of said rectangle are rounded and which has at least two T-shaped grooves recessed into each of the long sides of said rectangle, projecting into the section interior, and extending along the entire height of the section member.

4,463,058

SILICON CARBIDE WHISKER COMPOSITES

Paul E. Hood, and John O. Pickens, both of Greer, S.C., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 16, 1981, Ser. No. 274,256
Int. Cl.³ C01B *31/36*
U.S. Cl. 75—229 **9 Claims**


FORMING A SLURRY OF WHISKERS IN POLAR SOLVENT
ALUMINUM POWDER OR A SLURRY OF ALUMINUM POWDER IN A POLAR SOLVENT
MIXING
DISTILLATION
FORMING A BILLET
a. EXTRUDING OR b. FORGING

1. A method of preparing a composite material including a reinforced matrix of substantially uniformly distributed deagglomerated silicon carbide whiskers, comprising the steps of:

(a) deagglomerating agglomerated silicon carbide whiskers by mixing with a polar solvent and milling under conditions that result in a mixture substantially free from agglomeration; and

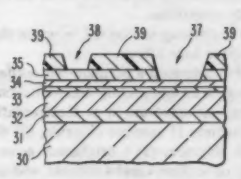
(b) mixing the deagglomerated whiskers with a matrix material to form a mixture of substantially uniformly and homogeneously dispersed whiskers within said matrix material.

4,463,059

LAYERED METAL FILM STRUCTURES FOR LSI CHIP CARRIERS ADAPTED FOR SOLDER BONDING AND WIRE BONDING

Somnath Bhattacharya, Wappingers Falls, N.Y.; Dudley A. Chance, Danbury, Conn.; Nicholas G. Koopman, Hopewell Junction, and Sudipta K. Ray, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 394,014
Int. Cl.³ H05K *3/06*
U.S. Cl. 428—620 **11 Claims**



1. A packaging substrate for integrated circuits including

a fan-out metallurgical structure including a conductor formed near the surface of the substrate,

a plurality of barrier layers overlying said structure,

said barrier layers being located above said conductor,

said barrier layers including in one layer a material adapted for providing solder pads having a surface adapted for the soldering of connections to said conductor

and another layer of said barrier layers including a material adapted for thermal bonding whereby said layers permit the connection of said conductor to other pad connections by soldering and thermal bonding solderlessly alternatively,

with some areas on the surface of said barrier layers comprising solder bonding surfaces and other areas on the surface of said barrier layers comprising thermal bonding surfaces with the solderless bonding surfaces comprising a metal selected from the group consisting of Au, Cr, Ti, Al and Co and the solder bonding surfaces comprising a metal selected from the group consisting of Au, Cu and Ni.

4,463,060

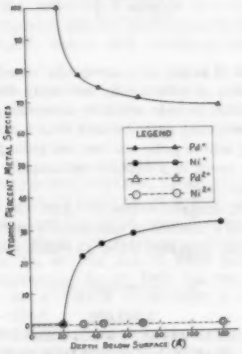
SOLDERABLE PALLADIUM-NICKEL COATINGS AND METHOD OF MAKING SAID COATINGS

Stephen W. Updegraff, Mechanicsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 15, 1983, Ser. No. 551,925

Int. Cl.³ C23C *3/00;* **C25D** *3/56, 5/48;* **B23K** *1/20*

U.S. Cl. 428—669 **7 Claims**



1. A permanently solderable article comprising a palladium-nickel electroplated coating on an electrically conductive substrate said coating having

A first alloy layer of 46 to 82 atomic percent palladium and 18 to 54 atomic percent nickel adhered to the substrate and a second continuous layer covering said first layer of 96 to 100 atomic percent metallic palladium and 0-4 atomic percent nickel, the second layer having a thickness up to twenty angstroms.

5. The article according to claim 1 wherein the substrate is nickel plated copper base alloy.

7. A process for obtaining a permanently solderable palladium-nickel coating on an electrically conductive substrate comprising immersing the substrate in an electroplating bath consisting of (1) palladium II ammine chloride, (2) nickel ammine sulfate or nickel chloride, (3) a brightener selected from the group consisting of sodium vinyl sulfonate, sodium allyl sulfonate and quaternized pyridine and (4) ammonium sulfate or chloride, at a temperature between 35°-55° C., a pH of 7.5 to 9, a current density of 5 to 25 amp/sq dm, with vigorous agitation to form a plated surface, and thereafter immersing the plated surface in a static aqueous solution of sulfuric or hydrochloric acid.

4,463,061

BOILER TUBE HAVING IMPROVED HIGH TEMPERATURE MECHANICAL STRENGTH, IMPROVED HIGH TEMPERATURE CORROSION RESISTANT PROPERTY AND RESISTANCE TO EMBRITTLEMENT DURING SERVICE

Yasuo Otoguro; Mikio Yamanaka; Katukuni Hashimoto, all of Sagamihara; Mizuo Sakakibara, Kawasaki, and Masao Onoyama, Hikari, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,836

Claims priority, application Japan, Jun. 11, 1982, 57-99388

Int. Cl.³ B32B *27/06*

U.S. Cl. 428—683 **16 Claims**

1. A boiler tube having improved high temperature strength, improved high temperature corrosion resistance, and resistivity to embrittlement during the service thereof, comprising an outer surface layer and an inner part,

said outer surface layer consisting essentially, by weight, of 0.03–0.20% carbon, 1.8–4.0% silicon, 0.1–3.0% manganese, 13–25% chromium, 13–40% nickel, 1.0–2.5% at least one kind selected from the group consisting of molybdenum and tungsten, 0.05–0.5% at least one kind selected from the group consisting of titanium, niobium and vanadium, and the balance iron and incidental impurities,

said inner part consisting essentially, by weight, of 0.03–0.20% carbon, 0.3–1.0% silicon, 0.1–3.0% manganese, 13–25% chromium, 13–40% nickel, 0.5–3.0% at least one kind selected from the group consisting of molybdenum and tungsten, 0.05–0.5% at least one kind selected from the group consisting of titanium, niobium and vanadium, and the balance iron and incidental impurities.

4,463,062

OXIDE BOND FOR ALUMINUM OXIDE COATED CUTTING TOOLS

Thomas E. Hale, Warren, Mich., assignor to General Electric Company, Detroit, Mich.

Filed Mar. 25, 1983, Ser. No. 478,948

Int. Cl.³ B32B *15/04;* **C22C** *29/00;* **C23C** *13/02, 13/04*

U.S. Cl. 428—698 **12 Claims**

1. In a process of manufacturing a hard metal cutting tool insert, the improvement comprising:

(a) coating the insert with a thin layer of a carbide, nitride, or carbonitride of a refractory metal;

(b) subjecting the thin layer to an oxidizing atmosphere to provide an oxide of said refractory metal of a higher order than a monoxide;

(c) reducing the higher oxide layer to provide a monoxide on the surface thereof; and

(d) depositing a hard water resistant coating on the said monoxide surface.

12. A cemented tungsten carbide cutter insert having multiple layers thereon, comprising the combination of a thin hard wear resistant outermost layer of Al_2O_3 securely bonded to a multilayered inner layer of TiO which was converted from one or more higher oxides of titanium which one or more higher oxides were converted from a TiC layer adjacent the cemented carbide.

4,463,063

HYDROGEN GENERATOR

Otto J. Adlhart, Newark, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed Jul. 16, 1982, Ser. No. 399,057

Int. Cl.³ H01M *8/18*

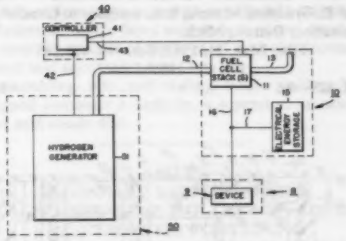
U.S. Cl. 429—19 **20 Claims**

1. A hydrogen generator of the type which relies at least partially on the process of anodic corrosion to generate hydrogen comprising:

(a) an anodic material having a relatively high ratio of surface area to volume,

(b) a cathode located closely adjacent to the surface of the anodic material,

(c) an aqueous electrolyte located between the anodic material and cathode, the stoichiometric ratio of anodic material to the water in the electrolyte being relatively low, and



(d) means for activating the generator allowing electric current to flow whereby the generator, upon activation, efficiently produces hydrogen at a rapid rate.

4,463,064

GALVANIC ELEMENT, ESPECIALLY METAL-AIR-CELL

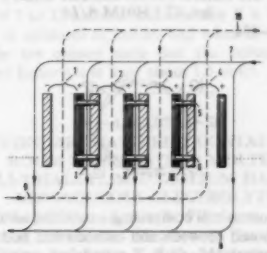
Jean Ruch; Detlef Katryniok, both of Brilon; Hugo Pack, Brilon-Bontkirchen, and Heinz-Günther Tillmann, Geseke, all of Fed. Rep. of Germany, assignors to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG, Brilon, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,354

Claims priority, application Fed. Rep. of Germany, May 15, 1982, 3218410

Int. Cl.³ H01M *2/00, 6/48*

U.S. Cl. 429—27 **11 Claims**



1. A galvanic bipolar element in the form of a flat, high power cell which is cooled with a cooling medium, utilizes a liquid electrolyte, and can be assembled with other such cells to form a battery; said element comprising:

bipolar electrodes, including a flat, consumable metal electrode as an anode, and a cathode, with said anode and said cathode being electrically interconnected; and

a gasket disposed between said anode and said cathode, and forming a cooling chamber.

4,463,065

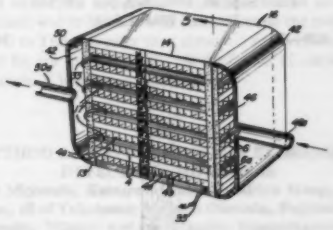
FUEL CELL AND METHOD FOR CONDUCTING GAS-PHASE OXIDATION

Louis Hegedus, Rockville, Md.; Costas G. Vayenas, and James N. Michaels, both of Cambridge, Mass., assignors to W. R. Grace & Co., New York, N.Y. and Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 2, 1982, Ser. No. 345,146

Int. Cl.³ H01M *8/12*

U.S. Cl. 429—33 **38 Claims**



1. A fuel cell comprising a plurality of stacked essentially planar parallel sheets of a fluid-impermeable solid electrolyte capable of transporting oxygen ions, each sheet possessing a plurality of parallel elongated channels separated by ribs, said sheets divided into first and second groups wherein the sheets of said groups are interposed in an alternate manner, the channels of said first group forming an angle with the channels of said second group, the channels of said first group having a catalytic, oxygen-dissociating material disposed therein and the channels of the second group having a catalyst for promoting oxidation reactions disposed therein, said electrolyte sheets having exterior surfaces coated with an electrically conductive material contacting the catalyst disposed in the channels of at least one adjacent sheet, each of said exterior surface coatings in electrically conductive communication with lead means adapted to communicate with an exterior electrical circuit.

4,463,066

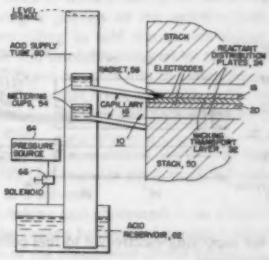
FUEL CELL AND SYSTEM FOR SUPPLYING ELECTROLYTE THERETO

Otto J. Adlhart, Tenafly, and Haim Feigenbaum, Highland Park, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Sep. 30, 1982, Ser. No. 430,144

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—34 **10 Claims**

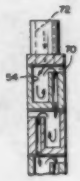


1. A system for supplying electrolyte to fuel cells in a stack of fuel cells comprising:

(a) means for storing electrolyte externally to said fuel cells, an individual one of said cells including a wicking medium for drawing electrolyte by capillary action;

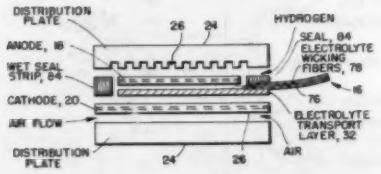
(b) means for conducting electrolyte from said storing means to the wicking medium in each of said cells; and
(c) means for maintaining a predetermined hydrostatic pressure of electrolyte at said conducting means.

4,463,067
FUEL CELL AND SYSTEM FOR SUPPLYING ELECTROLYTE THERETO UTILIZING CASCADE FEED
Haim Feigenbaum, Highland Park, N.J., assignor to Engelhard Corporation, Iselin, N.J.
Filed Sep. 30, 1982, Ser. No. 430,145
Int. Cl.³ H01M 8/04
U.S. Cl. 429—34 **14 Claims**



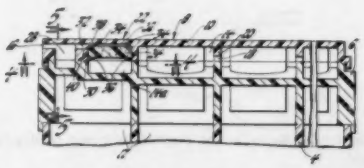
1. A system for supplying electrolyte to fuel cells in a stack of fuel cells comprising:
(a) means for storing electrolyte externally to said fuel cells, an individual one of said cells including a means for holding and drawing electrolyte, said storing means including compartments for the separate storage of electrolyte,
(b) means for conducting electrolyte from said compartments to the means for holding and drawing in respective ones of said cells; and
(c) means for maintaining a predetermined hydrostatic pressure of electrolyte at said conducting means, said pressure maintaining means including means for positioning of said compartments at heights corresponding to the locations of respective ones of said cells in said stack and means for allowing the electrolyte to overflow from one compartment to the next.

4,463,068
FUEL CELL AND SYSTEM FOR SUPPLYING ELECTROLYTE THERETO WITH WICK FEED
J. Gunther Cohn, West Orange; Haim Feigenbaum, Highland Park, and Arthur Kaufman, West Orange, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.
Filed Sep. 30, 1982, Ser. No. 430,155
Int. Cl.³ H01M 8/04
U.S. Cl. 429—34 **12 Claims**



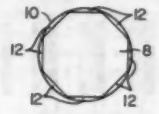
1. A system for supplying electrolyte to fuel cells in a stack of fuel cells comprising:
(a) means for storing electrolyte externally to said fuel cells, an individual one of said cells including an electrolyte matrix means for drawing electrolyte;
(b) means for conducting electrolyte from said storing means to the electrolyte matrix means in each of said cells, said conducting means including a wicking medium; and
(c) means for maintaining a predetermined hydrostatic pressure of electrolyte at said conducting means.

4,463,069
BATTERY VENTING SYSTEM
Michael E. Greenlee, Muncie, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 24, 1983, Ser. No. 478,285
Int. Cl.³ H01M 2/12
U.S. Cl. 429—86 **3 Claims**



1. In a venting system for an electric storage battery including an exhaust port for venting battery gases to the ambient and means for quashing any flame invading said system through said port, said means comprising: a porous flame-arresting filter intermediate a cell of said battery and said port for permitting egress of said gases while preventing ingress of said flame; a combustion chamber adjacent said port for the controlled combustion of said gases therein; a buffer chamber intermediate said combustion chamber and said filter to mitigate the impact of said controlled combustion on said filter; a partition separating said combustion and buffer chambers one from the other; and an aperture through said partition for communicating said combustion and buffer chambers, said aperture having an effective cross-sectional area which is sufficiently less than the cross-sectional area of said port that the forces generated by said controlled combustion are relieved primarily through said port and serve to prevent establishment of a sustained flame at said port incident to the ignition of said gases thereat.

4,463,070
CYLINDRICAL GALVANIC CELLS HAVING A POLYGONAL SHAPED ANODE DISC
Richard B. Affeldt, Westlake, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.
Filed Mar. 29, 1983, Ser. No. 480,295
Int. Cl.³ H01M 6/14
U.S. Cl. 429—194 **16 Claims**



1. A nonaqueous cell comprising a cathode, an anode disc, a separator disposed between said cathode and said anode disc, and an electrolyte housed in a cylindrical cupped container sealed at its open end by a closure means; the improvement wherein said anode disc has a circumference composed of at least four segments of which at least two segments are straight segments and wherein the single faced surface area of said anode disc is at least 82 percent of the area of a circle circumscribed about said anode disc.

10. A method for assembling a cylindrical, nonaqueous cell comprising the steps:
(a) preparing a cylindrical cupped container having a base, an upstanding side wall and an open end;

(b) preparing a strip of anodic material having a width equal to or smaller than the inner diameter of the cylindrical container;

(c) cutting said strips of anodic material in a length equal to or smaller than the inner diameter of the cylindrical cupped container to provide a polygonal anode disc having a circumference composed of at least four segments in which at least two segments are straight segments and wherein the single faced surface area of said anode disc is at least 82 percent of the area of a circle circumscribed about said anode disc; and

(d) assembling into and sealing within said cylindrical cupped container a cathode, a separator, an electrolyte and said anode disc.

4,463,071

SECONDARY BATTERIES USING ROOM-TEMPERATURE MOLTEN NON-AQUEOUS ELECTROLYTES CONTAINING 1,2,3-TRIALKYLIMIDAZOLIUM HALIDES OR 1,3-DIALKYLIMIDAZOLIUM HALIDE

Paul R. Gifford, Union; Lawrence W. Shacklette; James E. Toth, both of Maplewood, and James F. Wolf, Mine Hill, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

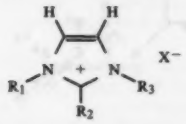
Filed Nov. 30, 1983, Ser. No. 556,496
Int. Cl.³ H01M 6/14
U.S. Cl. 429—194 **29 Claims**

1. A battery containing an anode, a cathode, and a molten, non-aqueous electrolyte wherein:

(a) the anode comprises conjugated backbone polymers or transition-metal chalcogenides into either of which are inserted alkali metal cations during charging;

(b) the cathode comprises a member selected from the group consisting of graphite, intercalation compounds of graphite, transition-metal chalcogenides, and conjugated backbone polymers; and

(c) the molten non-aqueous electrolyte comprises an admixture of aluminum halide, AlX_3 and 1,2,3-trialkylimidazolium halide having the formula TimX:



wherein the molar ratio of Al to Tim is no more than about 1:1 and wherein R_1, R_2 and R_3 are independently alkyl of 1 to 12 carbons and wherein X is independently halide or mixtures of halides and wherein the anode and cathode are chosen such that the voltage of a fully charged battery is at least about 1.5 volts.

4,463,072

SECONDARY BATTERIES CONTAINING ROOM-TEMPERATURE MOLTEN 1,2,3-TRIALKYLIMIDAZOLIUM HALIDE NON-AQUEOUS ELECTROLYTE

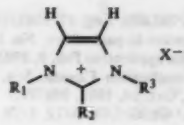
Paul R. Gifford, Union; James B. Palmisano, Roselle Park; Lawrence W. Shacklette, Maplewood; Ronald R. Chance, Morris Plains, and James E. Toth, Maplewood, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 30, 1983, Ser. No. 556,497
Int. Cl.³ H01M 6/14
U.S. Cl. 429—194 **26 Claims**

1. A battery containing an anode, a cathode, and a molten, non-aqueous electrolyte wherein:

(a) the anode comprises aluminum;

(b) the molten non-aqueous electrolyte comprises an admixture of aluminum halide having the formula AlX_3 and 1,2,3-trialkylimidazolium halide having the formula, TimX:



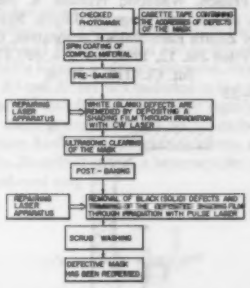
said admixture being disposed between said anode and cathode and in contact with each; wherein the molar ratio of Al to Tim is greater than about 1:1 and wherein R_1, R_2 and R_3 are independently alkyl of 1 to 12 carbons and wherein X is independently halide.

4,463,073

METHOD AND APPARATUS FOR REDRESSING DEFECTIVE PHOTOMASK

Tateoki Miyauchi; Katsuro Mizukoshi; Mikio Hongo; Masao Mitani, all of Yokohama; Masaaki Okunaka, Fujisawa; Takao Kawanabe, Mitaka, and Isao Tanabe, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 1, 1982, Ser. No. 394,642
Claims priority, application Japan, Jul. 3, 1981, 56-103357
Int. Cl.³ G03F 9/00
U.S. Cl. 430—5 **16 Claims**


CHECKED PHOTOMASK
CASSETTE TAPE CONTAINING THE ADDRESSES OF DEFECTS OF THE MASK
SPIN COATING OF COMPLEX MATERIAL
PRE-BAKING
REPAIRING LASER APPARATUS
WHITE (CLEAR) DEFECTS ARE REMEDIED BY DEPOSITING A SHADING FILM THROUGH IRRADIATION WITH CW LASER
ULTRASONIC CLEANING OF THE MASK
POST-BAKING
REPAIRING LASER APPARATUS
REMOVAL OF BLACK (SOLID) DEFECTS AND TRIMMING OF THE DEPOSITED SHADING FILM THROUGH IRRADIATION WITH PULSE LASER
SCRUB WASHING
DEFECTIVE MASK HAS BEEN REDRESSED

1. A method of correcting defects on a photomask comprising the steps of:

(a) coating at least a transparent defect portion and its periphery on the photomask having a transparent defect portion with a film of a metal-organo complex solution;

(b) pre-baking the coated portion of the photomask in a heat wave oven to form a film of the metal-organo complex;

(c) altering a portion of the metal-organo complex film corresponding to said transparent defect portion to an opaque and insoluble material by exposing said portion of metal-organo complex film to a laser beam having a visible ray or ultraviolet ray in a slit-like image until said portion of metal-organo complex film is altered into the opaque condition;

(d) removing a non-altered portion of said metal-organo complex film from the photomask by washing said photomask in a solvent;

(e) after-baking said photomask in an ultraviolet ray oven to thereby cause a half-altered portion formed in a peripheral fringe of the transparent defect portion to be altered into the opaque condition; and

(f) removing the altered portion which deviates from a desired circuit pattern and remaining defects originally present in said photomask through irradiation with a pulse-like laser beam projected in a slit-like light image.

4,463,074

ELEMENTS CONTAINING ORDERED WALL ARRAYS

Hugh S. A. Gilmour, Rochester, and Richard N. Blazey, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 293,080, Aug. 17, 1981, Pat. No. 4,411,973, which is a continuation-in-part of Ser. No. 196,947, Oct. 14, 1980, abandoned. This application Feb. 9, 1983, Ser. No. 465,078
Claims priority, application Canada, Sep. 8, 1981, 385363; European Pat. Off., Oct. 14, 1981, 304791.7
Int. Cl.³ G03G *5/04, 5/12, 1/76, 7/10*
U.S. Cl. 430—7 **68 Claims**

1. An element comprising:

support means, which is areally extended along an axial plane,

a predetermined, ordered array of lateral wall means positioned to interrupt radiation directed toward said axial plane at an acute angle to thereby shadow a first set of microareas of said support means while permitting the radiation to impinge a second, unshadowed set of microareas of said support means forming an interlaid pattern with said first microareas,

a first composition positioned on said support means in said first set of microareas, and

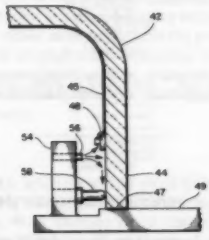
a second composition positioned on said support means in said second set of microareas.

4,463,075

PROCESS FOR FORMING CONDUCTIVE BRIDGE IN CATHODE RAY TUBES

Kenneth L. Fritsch, Wheaton; William A. Jordan, Hanover Park, both of Ill., and Hugo A. Lopez, San Diego, Calif., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 12, 1982, Ser. No. 397,375
Int. Cl.³ H01J *29/00*
U.S. Cl. 430—23 **1 Claim**



1. For use in the manufacture of a cathode ray tube having a face panel including a rearwardly extending skirt with a seal land for attachment to a funnel having a mating seal land, said face panel and skirt receiving an internal coat of electrically conductive dag, said face panel having an inner surface for receiving a pattern of discrete phosphor deposits overlaid with electrically conductive aluminum film, said tube including a shadow mask for color selection receiving a high voltage and held dependent adjacent to said face panel by a plurality of metal studs extending inwardly from said skirt, an improved method for providing positive electrical connection between said shadow mask, said dag and said aluminum film by way of said studs, the method being of the type including the steps of:

(a) cleaning and drying the panel;

(b) depositing on said inner surface of said panel at least one photosensitive pattern for receiving said phosphor deposits;

(c) depositing an electrically conductive dag on said patterns and said skirt and drying said dag;

(d) rewetting said dag and trimming the dag from said skirt;

(e) developing said photo-sensitive material and depositing said phosphor on said pattern;

(f) removing excess phosphor from said skirt with a water wash;

(g) extending an electrically conductive bridge from said studs to said dag;

(h) aluminizing said inner surface of said panel; an improvement which comprises replacement of step (f) with the following steps:

directing a flow of air toward the center of the inner surface of said panel effective to cause a counterflow of air across the inner surface of said skirt to thoroughly dry the dag coating on said skirt;

precision-trimming with acid the area of said skirt between the plane of said studs and said skirt seal line, leaving intact the connection between the studs and the dag;

such that a permanent electrical connection is maintained between said dag coating and said shadow mask without the need for the application of an electrically conductive mustache.

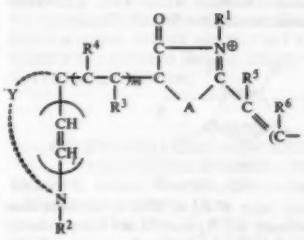
4,463,076

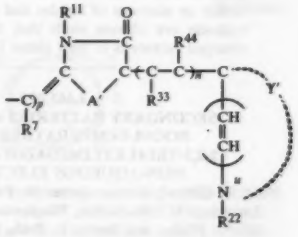
MEROCYANINE-CYANINE-MEROCYANINE (MCM) ELECTRICALLY PHOTOSENSITIVE COLORANTS FOR PHOTOELECTROPHORETIC IMAGING

Steven G. Link, and Frank G. Webster, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/US82/01133, 371 Date Feb. 22, 1983, 102(e) Date Feb. 22, 1983, PCT Pub. No. WO83/00752, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 23, 1982, Ser. No. 499,769
Int. Cl.³ G03G *13/048*
U.S. Cl. 430—37 **27 Claims**

1. An electrically photosensitive material comprising an electrically insulating carrier, either liquid or liquefiable under use, and a plurality of electrically photosensitive particles comprising a compound having the following color-conferring group:





wherein:

m and n, which are the same or different, are 0, 1 or 2;

t and u, which are the same or different, are 0 or 1;

p is 0, 1 or 2;

R^1 and R^{11}, which are the same or different, represent an alkyl, aryl, aralkyl, alkaryl, carbocyclic or heterocyclic group;

R^2 and R^{22}, which are the same or different, represent an

alkyl, aryl, aralkyl, alkaryl, carbocyclic or heterocyclic group;

R^3 and R^{33}, which are the same or different, represent hydrogen or an alkyl group;

R^4 and R^{44}, which are the same or different, represent hydrogen or an alkyl group;

R^4, when taken together with R^2 and t is 0, and

R^{44}, when taken together with R^{22} and u is 0, represent the atoms necessary to complete an alkylene or heteroalkylene bridge;

R^3 and R^4, and R^{33} and R^{44}, when taken together represent the atoms necessary to complete an alkylene or heteroalkylene bridge;

R^5, R^6 and R^7, which are the same or different, represent hydrogen or an alkyl group or, when individually taken together with R^1 or R^{11}, represent the atoms necessary to complete an alkylene or heteroalkylene bridge;

Y and Y^1, which are the same or different, represent the atoms necessary to complete a basic heterocyclic cyanine dye nucleus; and

A and A^1, which are the same or different, represent oxygen, sulfur, selenium or $-NR^8$, wherein R^8 represents an alkyl, aryl, aralkyl, alkaryl, carbocyclic or heterocyclic group.

4,463,077

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL COMPRISES PYRAZOLINE AND HYDRAZONE DERIVATIVES

Kazuo Matsuura, Kusatsu, and Keisuke Ohshima, Ootsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

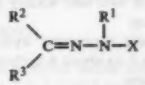
Filed May 25, 1983, Ser. No. 497,852

Claims priority, application Japan, May 26, 1982, 57-88122; Jun. 2, 1982, 57-92976

Int. Cl.³ G03G 5/06, 5/14

U.S. Cl. 430—56 **14 Claims**

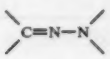
1. An electrophotographic photosensitive material comprising a photosensitive layer formed on an electroconductive substrate, said photosensitive layer containing a polymeric binder and an organic photoconductor represented by the following formula (I):



(I)

wherein

R^1 and R^2 either form a pyrazoline ring together with



or are not included in the same ring,

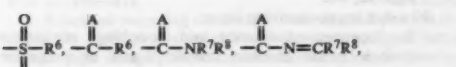
(i) in the case where R^1 and R^2 form a pyrazoline ring,

R^1 is $>CHR^4$ (where R^4 is an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms or a heterocyclic residue of 3- to 30-membered ring),

R^2 is $>CH_2$,

R^3 is $-CH{=}CH)_nR^5$ (where R^5 is an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms or a heterocyclic residue of 3- to 30-membered ring),

X is



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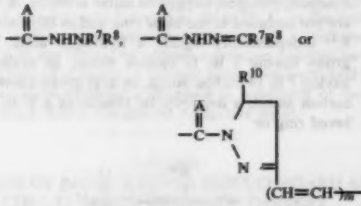
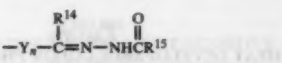


(wherein n is 0 or 1, m is 0 or 1, A is an oxygen atom or a sulfur atom, R^6, R^9 and R^{10} independently signify an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms or a heterocyclic residue of a 3-to 30-membered ring, and, R^7 and R^8 either form a ring together with the nitrogen atom to which R^7 and R^8 are bonded and in this case R^7 and R^8 independently signify a carbon, nitrogen, oxygen or sulfur atom, or, R^7 and R^8 are not included in the same ring and in this case R^7 and R^8 independently signify a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms or a heterocyclic residue of a 3- to 30-membered ring,

(ii) in the case where R^1 and R^2 are not included in the same ring,

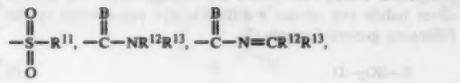
R^1 is a hydrogen atom,

R^2 and R^3 either form a ring together with the carbon atom to which R^2 and R^3 are bonded and in this case R^2 and R^3 independently signify a carbon, nitrogen, oxygen or sulfur atom, or, R^2 and R^3 are not included in the same ring and in this case R^2 and R^3 independently signify a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms, a heterocyclic residue of a 3- to 30-membered ring or

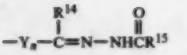


[where Y is a divalent group selected from an alkylene group having 1 to 12 carbon atoms, an aralkylene group having 7 to 14 carbon atoms, and an arylene group having 6 to 20 carbon atoms and a heterocyclic residue of a 3- to 30-membered ring, n is 0 or 1, R^{14} is a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms or a heterocyclic residue of a 3- to 30-membered ring, and R^{15} is an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms or a heterocyclic residue of a 3- to 30-membered ring],

X is



the nitrogen or carbon atom to which R^{12} and R^{13} are bonded and in this case R^{12} and R^{13} independently signify a carbon, nitrogen, oxygen or sulfur atom, or, R^{12} and R^{13} are not included in the same ring and in this case R^{12} and R^{13} independently signify a hydrogen atom, an alkyl group having 1 to 12 carbon atoms, an aralkyl group having 7 to 14 carbon atoms, an aryl group having 6 to 20 carbon atoms, a heterocyclic residue of a 3- to 30-membered ring or



10 [where Y, n, R^{14} and R^{15} are the same as defined above]), R^1 through R^{15} may be either substituted or not substituted.

4,463,078

CONDENSATION POLYMERIC PHOTOCONDUCTORS CONTAINING PENDANT ARYLAMINES

John M. Noonan, and Jerome H. Perlstein, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 285,235, Jul. 20, 1981, Pat. No. 4,395,475. This application May 5, 1983, Ser. No. 491,694

Int. Cl.³ G03G 5/07

U.S. Cl. 430—73 **44 Claims**

1. A polymeric photoconductor comprising a condensation polymer containing, as repeating units, the condensation residues of:

(a) a diacid, and

(b) an organic difunctional compound capable of undergoing condensation polymerization with said diacid,

wherein at least one of said residues contains an appended arylamine photoconductor group.

4,463,079

HEAT DEVELOPABLE COLOR PHOTOGRAPHIC MATERIALS WITH REDOX DYE RELEASERS

Hideki Naito; Hiroshi Hara, and Kozo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

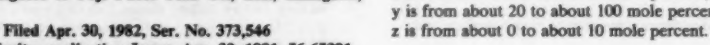
Filed Apr. 30, 1982, Ser. No. 373,546

Claims priority, application Japan, Apr. 30, 1981, 56-65391

Int. Cl.³ G03C 1/40, 5/54, 7/00

U.S. Cl. 430—203 **15 Claims**

15. A process for forming a color image which comprises heating a diffusion transfer heat-developable color photographic material, wherein said color photographic material comprises a support having coated thereon at least a photosensitive silver halide, an organic silver salt, a hydrophobic binder, a dye releasing activator and a dye releasing redox compound which can reduce the organic silver salt and/or silver halide and release a diffusible dye represented by the following general formula (I):



(I)

wherein R represents a reducing group capable of being oxidized by the organic silver salt and/or silver halide and wherein R has a hydrophilic group, and D represents an image forming dye part and does not have a carboxylic group or a sulfo group, after the exposure of said color photographic material to light to imagewise release the diffusible dye, to transfer the diffusible dye by said heating, and thereafter fixing said diffusible dye on an image receiving material.

4,463,080

POLYMERIC MORDANTS

Robert A. Snow, and Gerald W. Klein, both of Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

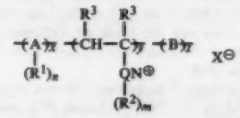
Filed Jul. 6, 1983, Ser. No. 511,425

Int. Cl.³ G03C 5/54, 1/40, 7/00; C08F 26/06

U.S. Cl. 430—213 **36 Claims**

1. In a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, said support also having thereon a dye image-receiving layer comprising a mordant,

the improvement wherein said mordant is a polymer comprising recurring units having the formula:



wherein

A represents recurring units derived from an α,β-ethylenically unsaturated monomer;

B represents recurring units derived from a monomer containing at least two ethylenically unsaturated groups;

$QN^{\oplus}$ represents a moiety containing a quaternized nitrogen group;

R^1 represents an alkoxy group having from 1 to about 8 carbon atoms or an alkylenedioxy group having from 1 to about 4 carbon atoms, said group being appended to an aromatic group of said A;

R^2 represents an alkoxy group having from 1 to about 8 carbon atoms or an alkylenedioxy group having from 1 to about 4 carbon atoms, said group being appended to an aromatic group of said $QN^{\oplus}$,

each n and m independently represents an integer from 0 to 5, with the proviso that said polymer contains recurring units having at least two said alkoxy groups or one said alkylenedioxy group;

each R^3 independently represents hydrogen or an alkyl group having from 1 to about 6 carbon atoms;

$X^{\ominus}$ represents an anion;

x is from about 0 to about 80 mole percent;

y is from about 20 to about 100 mole percent; and

z is from about 0 to about 10 mole percent.

4,463,081

4-HYDROXYALKYL-SUBSTITUTED 3-PYRAZOLIDINONE ELECTRON TRANSFER AGENTS

Drake M. Michno, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,085

Int. Cl.³ G03C 5/54, 7/00, 1/40, 5/26

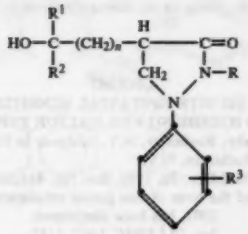
U.S. Cl. 430—218 **27 Claims**

1. In a photographic assemblage to be processed by an alkaline processing composition, said assemblage comprising:

(a) a photosensitive element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material; and

(b) a dye image-receiving layer;

the improvement wherein said assemblage contains a silver halide electron transfer agent or precursor thereof having the following formula:



wherein:

n is 0, 1 or 2;

R represents hydrogen or a hydrolyzable moiety;

R^1 and R^2 each independently represents hydrogen, an alkyl or substituted alkyl group of 1 to about 6 carbon atoms, an aryl or substituted aryl group of 6 to about 10 carbon atoms, or an aralkyl group of 6 to about 10 carbon atoms, with the proviso that when n is 0, then either R^1 or R^2, but not both, may be hydrogen; and

R^3 represents at least one alkyl or alkoxy group having from 1 to about 6 carbon atoms, methylenedioxy group or ethylenedioxy group.

4,463,082

SILVER DIFFUSION TRANSFER FILM UNIT WITH NOBLE METAL COMPOUND AS STABILIZER

John H. Ferguson, Attleboro; Kenneth S. Norland, Lexington, and Stephen R. Sofen, Cambridge, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 19, 1983, Ser. No. 486,395

Int. Cl.³ G03C *5/54, 7/04, 1/34*

U.S. Cl. 430—228 **18 Claims**

1. A photographic silver diffusion transfer film unit which comprises a photosensitive silver halide layer, silver precipitating nuclei layer and a protective layer intermediate said silver halide layer and said silver precipitating layer, said protective layer containing a stabilizing compound of the formula:

$$XS(CH_2)_nCOOR$$

wherein X is a noble metal below silver in the Electromotive Series of Elements, n is 1, 2 or 3 and R is an alkyl or substituted alkyl group; and a compound of the formula

$$H_xS_y[(CH_2)_bCOOZ]_m$$

wherein Z is hydrogen or alkyl, b is 1, 2 or 3; m is 1 or 2, x is 1 or 0, y is 1 or 2; when y=2, m=2 and x=0; and when y=1, m=1 and x=1.

9. The film unit as defined in claim 1 which includes an additive color screen.

4,463,083

THERMAL RECORDING ELEMENTS

Masao Kitajima; Osamu Seshimoto, both of Asaka; Tomizo Namiki; Fumiaki Shinozaki, both of Fujinomiya; Tomoaki Ikeda, Tokyo, and Yuzo Mizobuchi, Miyanodai, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 52,153, Jun. 26, 1979, abandoned. This application May 11, 1982, Ser. No. 377,100

Claims priority, application Japan, Jun. 29, 1978, 53-79072

The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.

Int. Cl.³ G03C *1/74;* G01D *15/34*

U.S. Cl. 430—273 **12 Claims**

1. A thermal recording element for recording information by thermally deforming a recording layer comprising a metal using a high intensity radiation and recording information by the change in the light transmitting and reflecting properties of the recording layer, comprising a support having formed thereon the recording layer, a first protective layer having a thickness of about 1 to 10 μm formed by coating a polymer having a softening point lower than about 70° C. on the recording layer, and a second protective layer having a thickness of about 1 to 10 μm formed by coating a polymer material having high mechanical strength on the first protective layer, said first protective layer minimizing decrease in sensitivity of the recording layer due to the second protective layer.

4,463,084

METHOD OF FABRICATING A CIRCUIT BOARD AND CIRCUIT BOARD PROVIDED THEREBY

Ken'ichi Mitsumori, Miyagi, and Kazuo Aikawa, Kashimadai, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 430,601

Claims priority, application Japan, Feb. 9, 1982, 57-19212; Feb. 17, 1982, 57-24176

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—315 **6 Claims**

1. A method of making a circuit board having a conductive pattern adapted to be engaged by contractors, including:

forming a layer of an aluminum oxide having crystals with open cells on the surface of an aluminum substrate;

forming a film of photosensitive material on said layer of aluminum oxide;

removing portions of the film of photosensitive material from said aluminum oxide layer in a pattern corresponding to said conductive pattern;

filling the open cells of the aluminum oxide exposed by said removing step with either a conductive material or a non-conductive material;

removing the remaining portions of the film of photosensitive material from said aluminum oxide layer; and

filling the open cells of the aluminum oxide exposed by removing said remaining portions to the film of photosensitive material with the other of said conductive or non-conductive material to form a pattern of conductive and non-conductive areas on said aluminum oxide layer.

4,463,085

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Akio Mitsui, and Masakazu Morigaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

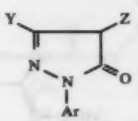
Filed Dec. 14, 1982, Ser. No. 449,812

Claims priority, application Japan, Dec. 14, 1981, 201309/81

Int. Cl.³ G03C *7/40*

U.S. Cl. 430—372 **22 Claims**

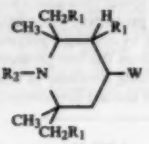
20. A method of forming a color image comprising developing an imagewise exposed silver halide color photographic light-sensitive material comprising a support having coated thereon at least one silver halide emulsion layer, the color photographic light-sensitive material containing at least one kind of 2-equivalent magenta coupler represented by the following general formula (Ia):



(Ia)

wherein Ar represents a phenyl group substituted with at least one halogen atom, an alkyl group having 1 to 22 carbon atoms, an alkoxy group having 1 to 22 carbon atoms, an alkoxycarbonyl group having 2 to 23 carbon atoms or a cyano group; Y represents an acylamino group having 1 to 32 carbon atoms or an anilino group having 6 to 44 carbon atoms; and Z represents a group capable of being released by coupling, and at least one

kind of piperidine compound to prevent the occurrence of stain represented by the following general formula (II):



(II)

wherein R_1 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; R_2 represents an alkyl group having from 1 to 12 carbon atoms, a hydroxyalkyl group having from 1 to 12 carbon atoms, an alkenyl group having from 3 to 4 carbon atoms, an alkynyl group having from 3 to 4 carbon atoms or a benzyl group; W represents a hydrogen atom, an alkyl group having 1 to 22 carbon atoms, a hydroxy group, a silyloxy group, an alkylamino group having 1 to 22 carbon atoms, an aryloxy group having 6 to 22 carbon atoms, an allyl group, an alkoxy group having 1 to 22 carbon atoms, an acylamino group having 1 to 22 carbon atoms, a sulfonamido group having 1 to 22 carbon atoms, an alkoxycarbonyl group having 2 to 23 carbon atoms, a carboxy group, with an aqueous alkaline solution containing a color developing agent.

4,463,086

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takashi Sasaki; Yutaka Kaneko; Fumio Ishii; Yasuo Tsuda; Kazuhiko Kimura, and Katsunori Kato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,556

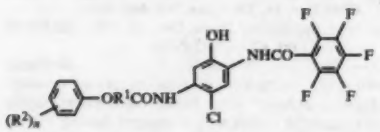
Claims priority, application Japan, Aug. 17, 1982, 57-142839; Aug. 17, 1982, 57-142840; Aug. 26, 1982, 57-149792

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—553 **18 Claims**

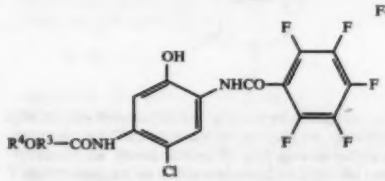
1. A light-sensitive silver halide color photographic material which comprises a light-sensitive silver halide emulsion layer containing at least one kind of cyan dye forming couplers represented by the formula [I] or the formula [II] as shown below provided on a reflective support:

Formula [I]



wherein R^1 represents a straight or branched alkylene group having 1 to 8 carbon atoms; R^2 represents an alkyl group; and n represents an integer of 1 to 3; R^2 may be the same or different when n is 2 or more,

Formula [II]



wherein R^3 represents a straight or branched alkylene group; and R^4 represents a phenyl group having an alkylsulfamoyl group, an arylsulfamoyl group, an alkylsulfonamide group, an arylsulfonamide group or an aminosulfonamide group.

4,463,087

CONTROLLED SITE EPITAXIAL SENSITIZATION OF LIMITED IODIDE SILVER HALIDE EMULSIONS

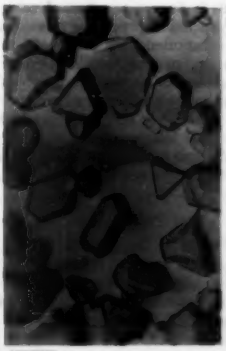
Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,367

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.³ G03C *1/02, 1/12*

U.S. Cl. 430—567 **40 Claims**



1. A silver halide emulsion comprised of

a dispersing medium,

silver halide host grains predominantly bounded by {111} crystal faces and containing insufficient iodide to direct silver salt epitaxy to selected surface sites of said grains, and

silver salt epitaxially located on and substantially confined to at least one of edge and corner sites of said grains.

4,463,088

SILVER HALIDE ANTIFOGGANTS BASED ON QUINOXALINE DERIVATIVES AND RELATED HETEROCYCLES

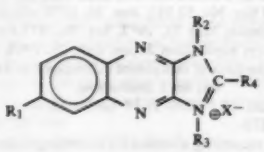
Joseph D. Overman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 5, 1983, Ser. No. 511,018

Int. Cl.³ G03C *1/34*

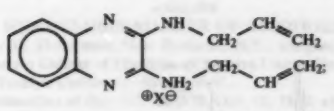
U.S. Cl. 430—614 **2 Claims**

1. A photographic film comprising a support, and a silver halide emulsion coated thereon, characterized in that said emulsion contains an antifogging amount of a quinoxaline derivative having one of the formulas

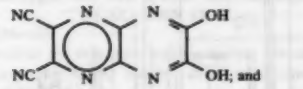


(a)

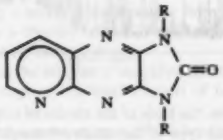
where R_1=H or NO_2, R_2 and R_3=H, alkyl, or alkene, R_4=alkyl, and X— is an anion;



(b)



(c)



(d)

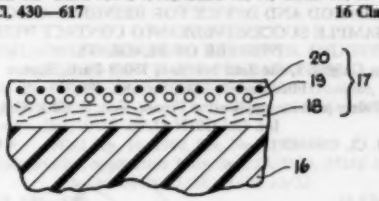
where R is alkyl.

4,463,089

REFLECTIVE OPTICAL DATA STORAGE AND LASER RECORDING MEDIUM

Eric W. Bouldin, Atherton, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Dec. 20, 1982, Ser. No. 451,605
Int. Cl.³ G03C 5/54, 1/76; G11C 13/04; G01D 15/10
U.S. Cl. 430—617 16 Claims



1. A reflective metal optical data storage and laser recording medium comprising

a low melting colloid matrix layer supported on a substrate,

an electrically non-conductive dispersion of reflective first metal particles in the matrix layer, with said paticles having a density greater at the surface distal to the substrate,

said first metal particles at the surface distal to the substrate having coatings of a second metal.

4,463,090

CASCADE AMPLIFICATION ENZYME IMMUNOASSAY

Curtis C. Harris, 8402 Thornden Ter., Bethesda, Md. 20034

Filed Sep. 30, 1981, Ser. No. 307,324
Int. Cl.³ G01N 33/54; C12Q 1/56, 1/38; C12N 9/96
U.S. Cl. 435—7 17 Claims

1. In an enzyme immunoassay wherein a fully active enzyme ligand is coupled to an immuno-reactive substance which will react with an assayed substance when said assayed substance is present, and a substrate for the fully active enzyme is provided, which substrate can be catalyzed by said enzyme only if such reaction has occurred, the improvement wherein a three-stage cascade assay is performed by:

using either one of the complement pair of

(i) a second proenzyme, or

(ii) a second activator for the second proenzyme, as the coupled ligand instead of the fully active enzyme;

inducing a third-stage catalysis by providing the remaining complementary second proenzyme or second activator so as to afford a catalytic activation of the second proenzyme to a second enzyme when the assayed substance is present;

inducing a second-stage catalysis when the assayed substance is present by providing a first proenzyme capable of being catalytically activated to a first enzyme by the second enzyme;

inducing a first-stage catalysis when the assayed substance is present by providing a substrate responsive to the first enzyme; and

measuring the change in said substrate when the assayed substance is present;

wherein each proenzyme is selected from one of the group consisting of inactive or less active forms of enzymes which are transferases or hydrolases, or active forms of any enzymes encapsulated in liposomes, whereby the sensitivity of the assay is geometrically increased by the multiplication of the third-stage turnover rate, the second-stage turnover rate, and the first-stage turnover rate.

4,463,091

METHOD OF PRODUCING AMYLASE INHIBITOR AI-B

Takahiro Harada, Ube; Eiji Miyagawa, Yamaguchi; Junko Umemoto, Ube; Tsutomu Yoshida, Onoda, and Toshinari Hamakado, Ube, all of Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1981, Ser. No. 267,828
Claims priority, application Japan, Jun. 4, 1980, 55-74203
Int. Cl.³ C12P 21/00, 21/02, 21/04; C12R 1/465
U.S. Cl. 435—68 4 Claims

1. A method of producing an amylase inhibitor, designated AI-B, having the characteristics:

(a) said inhibitor AI-B is a neutral polypeptide having an approximate molecular weight of 8,000, a pI value of 6.7 and contains no sugar;

(b) said inhibitor AI-B inhibits the activity of pancreatic amylase, but only slightly inhibits the activities of salivary amylase, bacterial α-amylase, gluco-amylase and malt β-amylase; and

(c) said inhibitor has an ultraviolet absorption maximum at 278 nm and an ultraviolet absorption minimum at 252 nm;

comprising the steps of cultivating *Streptomyces viridosporus* No. 297-A2, FERM-P No. 5405 in a culture medium containing nitrogen and carbon sources assimilable and digestable by said *Streptomyces viridosporus* No. 297-A2, FERM-P No. 5405, until said inhibitor AI-B is substantially accumulated in said culture medium; and then recovering said accumulated inhibitor AI-B.

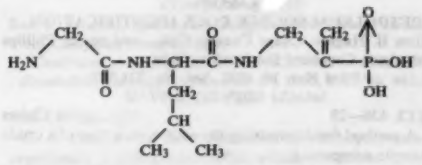
4,463,092

PROCESS FOR PRODUCTION ANTIBIOTIC A53868

Ronald D. Johnson; Ralph E. Kastner, both of Indianapolis; Stephen H. Larsen, Carmel, and Earl E. Ose, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 27, 1982, Ser. No. 424,805
Int. Cl.³ C12P 21/02; C12N 1/20; C12R 1/465
U.S. Cl. 435—70 5 Claims

1. The method of producing A53868 factor A of the formula



1

which comprises cultivating *Steptomyces luridus* NRRL 15101 or a mutant or recombinant thereof which produces A53868 factor A in a culture medium containing assimilable sources of carbon, nitrogen, and inorganic salts under submerged aerobic

fermentation conditions until a substantial amount of antibiotic activity is produced.

4,463,093

PROCESS FOR ISOMERIZING L-GLUCOSE TO L-FRUCTOSE

Robert O. Horwath, Westport, and William J. Colonna, Wilton, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,846
Int. Cl.³ C12P *19/24;* C12N *9/92;* C12R *1/72*
U.S. Cl. 435—94 **2 Claims**

1. A process for isomerizing L-glucose to L-fructose which comprises contacting L-glucose with xylose isomerase of low stereospecificity produced by a microorganism of the genus Candida.

4,463,094

FERMENTATION PRODUCTION OF L-THREONINE

Ichiro Chibata, Suita; Masahiko Kisumi, Kobe; Saburo Komatsubara, Kusatsu, and Kousaku Murata, Kyoto, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

Filed Mar. 17, 1981, Ser. No. 244,348
Claims priority, application Japan, Mar. 21, 1980, 55-36777
Int. Cl.³ C12P *13/08;* C12N *15/00, 1/20;* C12R *1/43*
U.S. Cl. 435—115 **7 Claims**

1. A method for the fermentative production of L-threonine which comprises cultivating *Serratia marcescens* strain Sr 41-P-103, FERM-P 5413, ATCC 31809, in a broth, accumulating L-threonine therein, and recovering accumulated L-threonine.

4,463,095

PROCESS FOR PRODUCING α-GLYCEROPHOSPHATE OXIDASE

Shigenori Emi; Yoshio Kojima, both of Tsuruga, and Makoto Ando, Ootsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1982, Ser. No. 444,374
Int. Cl.³ C12N *9/04;* C12R *1/01, 1/225, 1/46*
U.S. Cl. 435—190 **6 Claims**

1. A method for producing α-glycerophosphate oxides characterized in that an α-glycerophosphate oxidase producing microorganism belonging to genus Pediococcus, Streptococcus, Lactobacillus or Leuconostoc is cultivated in a nutrient medium containing at least one compound selected from the group consisting of α-keto acids represented by the formula,

R—COCOOH

wherein R is $CH_3(CH_2)_m$—, $HOOC(CH_2)_n$— or $CH_2(OH)CH(OH)CH$—(0H)CH— (in which m is an integer of 1 to 3 and n is an integer of 0 to 2) and salts thereof, and then α-glycerophosphate oxidase is recovered from the resulting culture broth.

4,463,096

PETROLEUM SOURCE ROCK IDENTIFICATION

William B. Hughes, Osage County, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

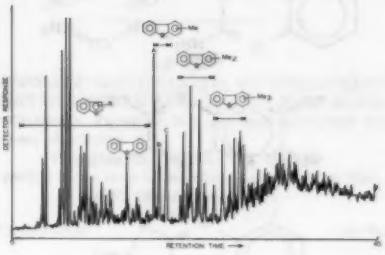
Filed Nov. 16, 1981, Ser. No. 321,507
Int. Cl.³ G01N *21/72, 31/08*
U.S. Cl. 436—29 **16 Claims**

1. A method for determining the source rock type of a crude oil sample comprising:

(a) determining the relative amounts of benzothiophenes and dibenzothiophenes in the sample of crude oil;

(b) determining the relative amounts of the isomeric methyldibenzothiophenes present in the sample of crude oil;

(c) determining the relative amounts of dimethyl- and trimethyldibenzothiophenes present in the sample of crude oil; and



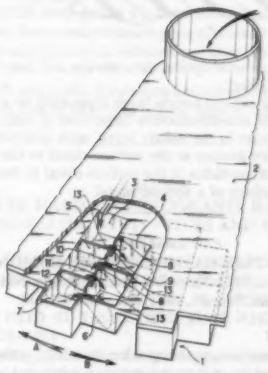
(d) identifying, on the basis of the results of steps a, b, and c, the source rock type of the crude oil sample.

4,463,097

METHOD AND DEVICE FOR BRINGING A LIQUID SAMPLE SUCCESSIVELY INTO CONTACT WITH A NUMBER OF REAGENTS

Jean Guigan, 9, rue Jean Mermoz, 75008 Paris, France

Filed Jun. 3, 1982, Ser. No. 384,703
Claims priority, application France, Jun. 5, 1981, 81 11158
Int. Cl.³ G01N *35/00, 21/01*
U.S. Cl. 436—45 **4 Claims**



1. A method for bringing a liquid sample successively into contact with a number of reagents by means of a series of intercommunicating cells carried by a rotor, the number of cells in said series being at least three and at least equal to the number of reagents, which are placed in said cells beforehand, said method comprising the steps of:

transferring said liquid sample from a first cell to an adjacent cell by rotating said rotor and

transferring said liquid in a sequential manner through subsequent cells by reversing the direction of rotation of said rotor after each transfer of said liquid sample from one cell to the adjacent cell.

4,463,098

HEMOGLOBIN MARKER OF ALCOHOLISM

Henry D. Hoberman, New Rochelle, N.Y., assignor to Albert Einstein College of Medicine of Yeshiva University a Division of Yeshiva University, Bronx, N.Y.

Continuation of Ser. No. 196,179, Oct. 14, 1980, abandoned. This application Oct. 3, 1983, Ser. No. 538,357

Int. Cl.³ G01N *33/72*

U.S. Cl. 436—67 5 Claims

1. A method for detecting and measuring chronic alcohol consumption constituting alcohol abuse in a human patient comprising:

a. obtaining a human blood sample from said patient;

b. isolating a fraction of said blood sample which contains glycosylated hemoglobins;

c. measuring the amount of said glycosylated hemoglobins as a percentage of the total amount of hemoglobin in said sample;

d. providing a measurement of the amount of glycosylated hemoglobins in a blood sample of a known alcohol abuser, the measured amount of the glycosylated hemoglobins of said abuser being more than about 6% of the total hemoglobin in said blood sample of the abuser; and

e. comparing the measurements of steps (c) and (d) whereby a comparison of said measurements determines the alcohol abuse of said patient.

4,463,099

IMMUNOFLUORESCENCE REAGENTS, AND THE METHOD FOR THEIR PREPARATION

Vittorio Baroncelli; Claudio Colapicchioni; Ivo Giannini, and Filippo Porcelli, all of Rome, Italy, assignors to Anic S.p.A., Palermo, Italy

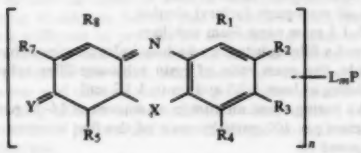
Filed Sep. 16, 1982, Ser. No. 419,053

Claims priority, application Italy, Sep. 25, 1981, 24161 A/81

Int. Cl.³ G01N *33/58, 33/54, 33/52*

U.S. Cl. 436—546 11 Claims

1. Immunofluorescence reagents of general formula



in which

n is a whole number between 1 and 4

n is a whole number equal to n or o

P is a protein

L is the residue of a cross-linking agent

X is an oxygen or sulphur atom

Y is a group chosen from NH, NH_2, NR' and NR'R'', where R' and R'', which can be the same or different, are substituted and unsubstituted alkyl, aryl, arylalkyl or alkylaryl radicals, or a OCOR' group where R' has the aforesaid meaning;

R_1, R_2, R_3, R_4, R_5, R_7 and R_8, which can be the same or different, are either a hydrogen atom or an amino group or a substituted or unsubstituted alkyl, aryl, alkylaryl or arylalkyl radical, or R_1 and R_2 and/or R_7 and R_8 are bivalent radicals which close together to thus form a condensation ring with the cycloaromatic ring;

at least one of R_1, R_2, R_3, R_4, R_5, R_7 and R_8 must be an amino group which on reacting with the cross-linking reagent gives rise to —NH—L or N=L group.

4,463,100

REFRACTORY GUN MIX

Nicholas Cassens, Jr., Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Jul. 8, 1983, Ser. No. 512,073

Int. Cl.³ C04B *35/04, 35/22*

U.S. Cl. 501—108 8 Claims

1. A refractory composition suitable for gunning consisting essentially of from 5 to 95% of a stabilized lime aggregate, said aggregate containing at least 75% total $CaO+Fe_2O_3+SiO_2+MgO$, the remainder being other refractory oxides, the $CaO:SiO_2$ weight ratio being at least 1.8, whereby dicalcium silicate is a major crystalline phase in the aggregate, said aggregate having less than 7% free lime, from 1 to 10% of a basic inorganic bond, and from 0.05 to 5% plasticizer, the balance of the composition being basic refractory aggregate, all percentages being by weight based on the total weight of the composition.

4,463,101

CATALYST FOR CONVERTING SYNTHESIS GAS TO HIGH OCTANE PREDOMINANTLY OLEFINIC NAPHTHA

Francis G. Dwyer, West Chester, Pa., and William E. Garwood, Haddonfield, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 220,923, Dec. 29, 1980, Pat. No. 4,361,503, which is a continuation-in-part of Ser. No. 76,027, Sep. 17, 1979, abandoned, which is a continuation of Ser. No. 926,987, Jul. 21, 1979, Pat. No. 4,172,843. This application Nov. 24, 1982, Ser. No. 444,260

The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.

Int. Cl.³ B01J *29/28, 29/30*

U.S. Cl. 502—74 8 Claims

1. A catalyst composition comprising an iron-containing Fischer-Tropsch component and a volume excess of a solid containing a crystalline zeolite, wherein the crystalline zeolite comprising a zeolite having a composition in its anhydrous state in terms of mole ratios of oxides as follows:

(a) an $Al_2O_3:SiO_2$ ratio within the range of from 0 to less than 0.005 Al_2O_3 to more than 1 SiO_2 and

(b) an $(XR_2O+(1-x)M_2/_nO):SiO_2$ ratio of less than 1.1:1

where M is a metal other than a metal of Group IIIA, n is the valence of said metal, R is alkylammonium and x is a number greater than 0 but not exceeding 1, said zeolite having the x-ray diffraction lines set forth in Table 1 or Table 2 of the specification.

2. The catalyst of claim 1 wherein M is sodium or sodium in combination with tin, calcium, nickel or zinc.

4,463,102

POLYOLEFIN POLYMERIZATION CATALYST CONTAINING STERICALLY UNHINDERED PHENOLIC COMPOUNDS (II)

Rolf F. Foerster, Morris, Ill., assignor to Northern Petrochemical Company, Omaha, Nebr.

Continuation-in-part of Ser. No. 322,979, Nov. 11, 1981, abandoned. This application Jan. 28, 1983, Ser. No. 461,693

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—127 6 Claims

1. A catalyst for the preparation of homopolymers and copolymers of alpha monoolefins which comprises

(1) a titanium halide of the formula

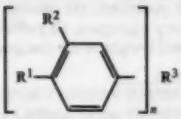
$$TiCl_3.mAlCl_3$$

where m is a number from 0 to 0.5,

(2) an aluminum-alkyl of the formula

where X and Y are each alkyl of not more than 8 carbon atoms, and Z is chlorine or alkyl of not more than 8 carbon atoms, with the proviso that the molar ratio of titanium halide:aluminum-alkyl is from 1:1 to 1:20, wherein the catalyst contains, as a further component

(3) a sterically unhindered phenolic compound of the formula



where n is an integer from 1 to 4; one of R^1 and R^2 is hydroxyl and the other is hydrogen; and R^3 is $-(CH_2)_x-COOR^4$, where x may be 0, 1, or 2, and R^4 is methyl, ethyl, n-propyl, n-butyl, n-pentyl, 2-ethylhexyl, or n-octyl; with the proviso that the molar ratio of aluminum-alkyl:-phenolic compound is from 1:1 to 40:1.

4,463,103

TOLUIC ACID

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 328,843, Dec. 9, 1981, Pat. No. 4,431,839. This application Oct. 19, 1983, Ser. No. 543,348

Int. Cl.³ B01J *31/06*

U.S. Cl. 502—159 **3 Claims**

1. Perfluorinated polymeric sulfonic acid having, based on the sulfonic acid groups, about 5 to 98.5 mol % of hydrogen ions and 1.5 to about 95 mol % of rhodium or iridium and cupric ions, the molar ratio of cupric ions to rhodium or iridium ions being at least 0.5.

4,463,104

PLATINUM GROUP AND PHOSPHORUS CONTAINING CATALYST COMPOSITION FOR HYDROCARBON CONVERSION

George J. Antos, Bartlett, and Tai-Hsiang Chao, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 324,302, Nov. 23, 1981, Pat. No. 4,367,137, which is a continuation of Ser. No. 212,780, Dec. 4, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,544

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—213 **35 Claims**

1. A catalyst comprising a platinum group component, a phosphorous component and a porous support material, said catalyst being made by the method of

(a) compositing a platinum group component with a porous support material,

(b) contacting the composite from step (a) with phosphorus or a compound of phosphorus at a temperature less than 700° F. so that the phosphorus to platinum group component atomic ratio is greater than 0.5, and

(c) then reducing the composite from step (b) to decrease the oxidation state of a catalyst component without an intermediate oxidation step.

4,463,105

PROCESS FOR PRODUCING OXYGEN-CONTAINING HYDROCARBON COMPOUNDS

Masaru Ichikawa, Yamato; Kohichi Shikakura, Sagamihara; Kazuhiko Sekizawa, Shinsanyo, and Kazuaki Tanaka, Kawasaki, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Division of Ser. No. 221,611, Dec. 31, 1980, abandoned. This application Jun. 9, 1982, Ser. No. 387,265

Claims priority, application Japan, Apr. 21, 1980, 55-51762; Apr. 21, 1980, 55-51763

Int. Cl.³ C07C *27/06*

U.S. Cl. 518—716 **10 Claims**

1. In a process for producing an oxygen-containing hydrocarbon compound having 1 or 2 carbon atoms which comprises reacting a gaseous mixture of a carbon oxide and hydrogen in the presence of a hydrogenation catalyst, the improvement wherein said hydrogenation catalyst is a catalyst composition consisting essentially of

(i) substantially metallic rhodium;

(ii) a metal element selected from the group consisting of niobium, tantalum and rhenium;

(iii) an oxide of a metal selected from the group consisting of zirconium and titanium; and

(iv) silica.

4,463,106

NON-FLAMMABLE RIGID FOAM AND ITS USE AS A BUILDING MATERIAL

Erich Rühl, Saalburgstrasse 65, 6382 Friedrichsdorf/Ts., and Johann Thenner, Pohlheim, both of Fed. Rep. of Germany, assignors to Erich Rühl, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,403

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244779

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—103 **4 Claims**

1. A process for making a non-flammable rigid foam which comprises:

preparing a first mixture

comprising:

(a) 50–62 mass parts resolic resin,

0–15 mass parts furanic resin,

25–40 mass parts furfuryl alcohol,

0,5–1,5 mass parts foam stabiliser,

and a filler substance which includes aluminum hydroxide, the mass ratio of resin substance:filler substance being at least 1:2,5 and up to 1:3,2 and

(b) a curing agent mixture in an amount of 14–17 parts by mass per 100 parts by mass of the first mixture, composed of:

40–50 mass parts phosphoric acid,

12–17 mass parts boron hydrofluoric acid,

6–7 mass parts p-toluene sulphonic acid or p-phenol sulphonic acid and

32–35 mass parts water,

and mixing the mixtures (a) and (b) and causing the mixture to rise to a bulk density of 50 to 450 kg/m^3 by the action of a foaming agent.

4,463,107

POLYMER/POLYOL COMPOSITIONS HAVING IMPROVED COMBUSTION RESISTANCE

Donald W. Simroth, Charleston; Frank E. Critchfield, and Edgar G. Shook, both of South Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 378,651, May 18, 1982, abandoned. This application Aug. 18, 1982, Ser. No. 409,177

Int. Cl.³ C08L *75/04*

U.S. Cl. 521—137 **25 Claims**

1. A stable dispersion of a polymer in a polyol, said dispersion being useful in the preparation of polyurethane foams

having improved combustion resistance, wherein the polymer is a free-radical initiated copolymer containing from about 0.5 to 75 weight percent, based on the copolymer, of acrylonitrile and from about 25 to 99.5 weight percent, based on the copolymer, of at least one other polymerizable ethylenically unsaturated monomer and wherein the copolymer is characterized by a crosslinking coefficient of less than about 55.

4,463,108

PRECIPITATED SILICA PIGMENT FOR SILICONE RUBBER

Melvin P. Wagner; Joseph P. Tultz, both of Barberton, and Thomas G. Krivak, Akron, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 279,369, Jul. 1, 1981, abandoned. This application Aug. 11, 1982, Ser. No. 407,183

Int. Cl.³ C09C *1/28*

U.S. Cl. 523—216 **22 Claims**

1. Finely-divided amorphous, precipitated, high structure silica consisting essentially of at least 85 weight percent SiO_2 on an anhydrous basis, less than 2 weight percent of a water soluble alkali metal sulfate salt, less than 1 weight percent of a water soluble alkali metal chloride salt, and from about 0.05 to 5 weight percent of alkali metal oxide, the total amount of said alkali metal salts and oxide in said silica being from about 1 to about 5 weight percent, and having deposited on its surface the oxide of a metal selected from the group consisting of calcium, barium and mixtures of such metals in amounts sufficient to provide on said silica at least an equal molar amount of said metal based on the total amount of alkali metal present in the silica, said amount of metal being such that a silicone rubber reinforced with said silica as the principal silica filler exhibits a water volume swell of not more than 4 percent and a wet dielectric strength of at least 400 volts/mil.

8. A composition comprising silicone elastomer gum curable with a free radical generator and from 10 to 100 parts per 100 parts of silicone gum, of reinforcing, amorphous precipitated, high structure silica consisting essentially of at least 85 weight percent SiO_2 on an anhydrous basis, less than 2 weight percent of a water soluble alkali metal sulfate salt, less than 1 weight percent of a water soluble alkali metal chloride salt, and from about 0.05 to 5 weight percent of alkali metal oxide, the total amount of said alkali metal salts and oxide in said silica being from about 1 to about 5 weight percent, and having deposited on its surface the oxide of a metal selected from the group consisting of calcium, barium and mixtures of such metals in amounts sufficient to provide on said silica at least an equal molar amount of said metal based on the total amount of alkali metal present in the silica, said amount of metal being such that, when said silicone elastomer gum composition is cured, the resulting silicone rubber exhibits a water volume swell of not more than 4 percent and a wet dielectric strength of at least 400 volts/mil.

15. In the method of preparing amorphous, precipitated, high structure silica by acidulating an aqueous alkali metal silicate solution with inorganic acid, the improvement of preparing a precipitated, high structure silica useful for reinforcing silicone rubber, which comprises determining the total amount of alkali metal of the precipitated silica and in response to such determination, depositing on the surface of said precipitated silica metal oxide of a metal selected from the group consisting of calcium, barium and mixtures of such metals in amounts sufficient to provide on said silica at least an equal molar amount of said metal based on the total amount of alkali metal present in the silica, the amount of metal being such that a silicone rubber reinforced with said precipitated silica as the principal silica filler exhibits a water volume swell of not more than 4 percent and a dielectric strength of at least 400 volts/-mil, and wherein the metal oxide is deposited from an aqueous solution of an ionizable oxide, hydroxide or C_1–C_4 carboxylic acid salt of said metals.

19. In the method of preparing amorphous, precipitated, high structure silica by acidulating an aqueous sodium silicate solution with inorganic acid, the improvement of preparing a precipitated, high structure silica useful for reinforcing silicone rubber, which comprises determining the concentration of the chloride, sulfate and sodium ionic species in the silica and, in response to said determination, depositing an oxide of calcium on the surface of said precipitated silica from an aqueous solution of an ionizable oxide or hydroxide of calcium in amounts sufficient to satisfy the following relationship:

$$\frac{4 - C_1[Cl^-] - C_2[SO_4^=] - C_3[Na^+]}{C_4} \leq [Ca^{++}]$$

wherein C_1, C_2, C_3 and C_4 are numerical coefficients which respectively vary from 8 to 12, 1 to 3, 9.5 to 14.5 and −5.5 to −8.5, and Cl^-, $SO_4^=$, Na^+ and Ca^{++} are the weight percent of said ions in the silica expressed as sodium chloride, sodium sulfate, sodium oxide and calcium oxide.

4,463,109

ASBESTOS FREE JOINTING

David Green; Alan D. Stancliffe, both of Rochdale; Lawrence W. Ramsbottom, Halifax, and David A. Thomas, Littleborough, all of England, assignors to TBA Industrial Products Limited, Manchester, England

Filed Dec. 7, 1983, Ser. No. 558,712

Claims priority, application United Kingdom, Mar. 12, 1981, 8107802

Int. Cl.³ C08D *7/04*

U.S. Cl. 523—333 **13 Claims**

1. A process for making an asbestos-free glass fiber reinforced sheet composed of individual glass fibers distributed throughout an elastomer system, said process comprising the successive steps of:

(1) providing glass fibers having a surface treatment coating being readily soluble in the solvent used in compounding the curable elastomer dough facilitating coating of the elastomer onto the glass fibers;

(2) mixing the glass fibers off step (1) with a solvent and removing the surface treatment coating;

(3) preparing a curable elastomer dough by mixing the glass fibers and solvent of step (2) with a curable elastomer in amounts such that the finished fiber reinforced sheet contains from about 10 to about 35% by weight of elastomer and from about 20 to about 70% by weight of said glass fibers;

(4) mixing and compounding the curable elastomer dough prepared in step (3) until the glass fibers are dispersed throughout the elastomeric binder and the individual glass fibers are coated with elastomer; and

(5) subjecting the compounded curable elastomeric dough to "it" calendering until an absestos-free fiber reinforced sheet of the desired thickness is produced.

4,463,110

NEOPRENE LATEX CONTACT ADHESIVES

Witold Perlinski, Middlesex; Irwin J. Davis, Bridgewater, and John F. Romanick, Denville, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 237,791, Feb. 24, 1981, Pat. No. 4,342,843, which is a continuation-in-part of Ser. No. 16,711, Mar. 1, 1979, abandoned. This application Feb. 18, 1982, Ser. No. 349,803

Int. Cl.³ C08L *9/00, 61/04, 63/00*

U.S. Cl. 523—409 **8 Claims**

1. An improved multi-part aqueous contact adhesive composition containing not more than a minor amount of organic solvent consisting essentially of an unreacted blend of:

(a) a neoprene latex,

(b) a polyamine selected from the group consisting of isophorone diamines, tetraethylene pentamine, ethylene diamine, diethylene triamine, triethylene tetramaine, propylene diamine, butylene diamine and hexamethylene diamine,

(c) an epoxy resin, and

(d) a tackifier selected from the group consisting of phenolic resins and phenolic-modified terpene resins;

wherein for every 100 parts by weight of dry neoprene, the epoxy resin is present in an amount of 10 to 40 parts, the polyamine in an amount sufficient to provide 50 to 150% of the stoichiometric amount required to cure the epoxy, and the tackifier in an amount of 20 to 50 parts.

4,463,111

CATHODE-DEPOSITING ELECTROCOATING COMPOSITION, AND PRODUCTION THEREOF

Teruaki Kuwajima, Higashiosaka, and Akira Matsumura, Hirakata, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

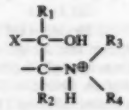
Filed Nov. 15, 1982, Ser. No. 441,852

Claims priority, application Japan, Nov. 16, 1981, 56-183966

Int. Cl.³ C08L *63/08*

U.S. Cl. 523—413 **8 Claims**

1. A cathode-depositing electrocoating composition which comprises as a film-forming component a carbon-to-carbon double bond containing resin having a principal chain of acetylene-conjugated diene random copolymer and a basic group, combined to the principal chain in a ratio of from 0.02 to 0.8 mol per 100 g of said resin and capable of forming in an aqueous medium a group of the formula:



wherein R_1 and R_2, which are the same or different, are each a hydrogen atom, a halogen atom or a hydrocarbon residue having 1 to 6 carbon atoms, R_3 and R_4, which are the same or different, are each a hydrogen atom or an organic residue having 1 to 10 carbon atoms, or R_3 and R_4 are combined to form, together with the intermediary nitrogen atom, a cyclic group having 1 to 7 carbon atoms, and X is a hydrogen atom or a bond, and when X is a bond, both the carbon atoms carrying R_1 and R_2 are bonded or belong to the principal chain, said resin being dissolved or dispersed in an aqueous medium by neutralization with an acid.

4,463,112

PHENYLETHYLIDENE-SUBSTITUTED PHENYL POLYPHOSPHITES

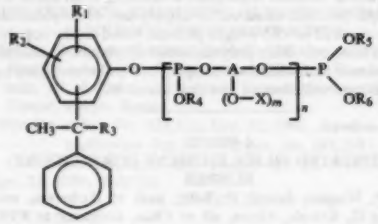
William E. Leistner, 1458 Bay Blvd., Atlantic Beach, N.Y. 11509; Motonobu Minagawa, 1-207-3 Shichizacho, Koshigaya, Japan; Yutaka Nakahara, 406-71, Minamishimoarai, Iwatsuki, Saitama, Japan, and Kazumi Kitsukawa, 3-12, Hikonari, Misato, Saitama, Japan

Filed Feb. 13, 1980, Ser. No. 121,133

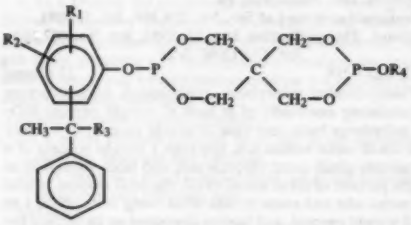
Int. Cl.³ C08K *5/52*

U.S. Cl. 524—109 **19 Claims**

1. A synthetic resin composition having enhanced resistance to deterioration on exposure to heat and light comprising a synthetic resin selected from the group consisting of ethylene-vinyl acetate copolymers, alkanediolterephthalate linear polyesters, polyvinyl chloride, and ABS polymer, and a polyphosphite ester represented by formula (I) or formula (II)



(I)



(II)

in which each of R_1 and R_2 is selected from the group consisting of hydrogen, alkyl and alkoxy having from one to ten carbon atoms, aryl having from six to fourteen carbon atoms, alkaryl and aralkyl having from seven to twenty-four carbon atoms, and halogen; R_3 is hydrogen or methyl; and each of R_4, R_5 and R_6 is selected from the group consisting of hydrogen, alkyl and cycloalkyl having from six to twenty carbon atoms, aryl having six to fourteen carbon atoms, alkaryl and aralkyl having from seven to twenty-four carbon atoms, ether-linked groups having from three to seventy-five carbon atoms and from one to thirty ether oxygen atoms, and $—A—(OH)_{m+1}$ in which m is 0 or 1; n is a number from 1 to 10; A is a residue of a phenol or alcohol having from two to three hydroxy groups, and X is hydrogen or $—P(—OR_5)OR_6$, and a synthetic resin stabilizer selected from the group consisting of phenolic antioxidants, thioether sulfur antioxidants, organic phosphites having one phosphite group, epoxidized oils, and monocarboxylic acid salts of Group II metals.

4,463,113

BIS-PHENOL PHOSPHATES AS CLARIFIERS FOR POLYOLEFIN RESINS

Yutaka Nakahara, 406-71, Minamishimoarai, Iwatsuki City, Saitama; Mitsuo Akutsu, 6-16-30, Aoto, Katsushika, Tokyo; Tohru Haruna, 969-4, Shimohideya, Okegawa City, Saitama, and Masayuki Takahashi, 4-15-26, Midorimachi, Tokorozawa City, Saitama, all of Japan

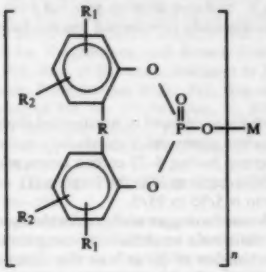
Filed May 20, 1982, Ser. No. 379,821

Claims priority, application Japan, Jun. 25, 1981, 56-98816

Int. Cl.³ C08K *5/52*; C07F *9/21*

U.S. Cl. 524—117 **32 Claims**

1. Bis-phenol phosphates having the formula:



I

wherein:

R is selected from the group consisting of a carbon-to-carbon bond; thio sulfur —S—; and alkylidene

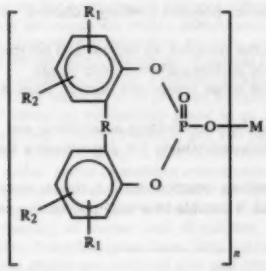
in which R_3 and R_4 are selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms, and cycloalkyl, including cycloalkylidene in which R_3 and R_4 are taken together as part of a cycloalkylene ring, having from three to about twelve carbon atoms;

R_1 and R_2 are each selected from the group consisting of hydrogen, alkyl having from about one to about eighteen carbon atoms; and cycloalkyl having from three to about twelve carbon atoms;

M is a metal atom selected from the group consisting of alkali metal atoms and alkaline earth metal atoms; and

n is the valence of the metal atom M, ranging from one to two.

20. An α-olefin polymer composition having improved clarity comprising a polymer of an α-olefin having two to six carbon atoms and an amount to improve clarity of at least one bis-phenol phosphate having the formula:



I

wherein:

R is selected from the group consisting of a carbon-to-carbon bond; thio sulfur —S—; and alkylidene

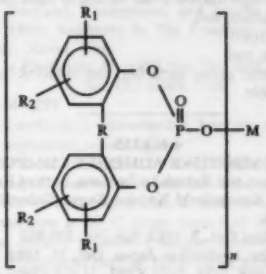
in which R_3 and R_4 are selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms, and cycloalkyl, including cycloalkylidene in which R_3 and R_4 are taken together as part of a cycloalkylene ring, having from three to about twelve carbon atoms;

R_1 and R_2 are each selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms; and cycloalkyl having from three to about twelve carbon atoms;

M is a metal atom selected from the group consisting of alkali metal atoms and alkaline earth metal atoms; and

n is the valence of the metal atom M, ranging from one to two.

30. A stabilizer composition for improving the clarity of polymers of α-olefins having two to six carbon atoms, comprising a heat or light stabilizer for α-olefin polymers and a bis-phenol phosphate having the formula:



I

wherein:

R is selected from the group consisting of a carbon-to-carbon bond; thio sulfur —S—; and alkylidene

in which R_3 and R_4 are selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms, and cycloalkyl, including cycloalkylidene in which R_3 and R_4 are taken together as part of a cycloalkylene ring, having from three to about twelve carbon atoms;

R_1 and R_2 are each selected from the group consisting of hydrogen, alkyl having from one to about eighteen carbon atoms; and cycloalkyl having from three to about twelve carbon atoms;

M is a metal atom selected from the group consisting of alkali metal atoms and alkaline earth metal atoms; and

n is the valence of the metal atom M, ranging from one to two.

4,463,114

ANTISTATIC FILMS

Robert J. Baichunis, and Frank T. Sher, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1982, Ser. No. 363,870

Int. Cl.³ C08L *83/06*

U.S. Cl. 524—157 **19 Claims**

1. A coating composition comprising 1 to 95 weight percent of a hydrolyzate of a hydroxyorganosilane and 5 to 99 weight percent of an aqueous solvent, said hydroxyorganosilane having the general formula:

$$R^1—Si(OR^2)_3$$

wherein R^1 is a di-hydroxy- or polyhydroxy-substituted organic group selected from:

(a) alkyl groups containing from 2 to about 8 carbon atoms and substituted by 2 to 7 hydroxy groups, with any single carbon atom having at most one hydroxy group attached;

(b) alkyl groups and cyclic alkyl groups having 2 to 20 carbon atoms, which carbon chain may be interrupted by one or more oxygen atoms and containing at least two hydroxyl groups per 8 carbon atoms with any single carbon atom having at most one hydroxy group attached;
(c) aralkyl or alkaryl groups containing 7 to 10 carbon atoms, said aralkyl or alkaryl group having 2 to 8 hydroxy groups, with any single carbon atom having at most one hydroxy group attached;
(d) alkenyl groups containing 4 to 8 carbon atoms and 2 to 5 hydroxy groups with any single carbon atom having at most one hydroxy group attached;
(e) cyclic or alkyl-substituted cyclic groups having 3 to 8 carbon atoms and substituted by 2 to 7 hydroxy groups, with any single carbon atom having at most one hydroxy group attached; and

R^2 is selected from:
(a) hydrogen, and
(b) any organic group such that the $-Si(OR^2)_3$ moiety is hydrolyzable.

4,463,115

PRESSURE SENSITIVE ADHESIVE COMPOSITION

Toshifumi Hirose, and Katsuhiko Isayama, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 7, 1983, Ser. No. 539,953
Claims priority, application Japan, Oct. 15, 1982, 57-181843
Int. Cl.³ C08K *5/54, 5/15;* **C08L** *71/02;* **C08G** *65/32*
U.S. Cl. 524—188 **7 Claims**

1. A pressure sensitive adhesive composition comprising (A) a polyether having at least one silicon-containing hydrolyzable group, having an average molecular weight of 300 to 30,000 and having a principal chain which is essentially constructed with the chemically bonded recurring units:

$$-R^1-O-$$

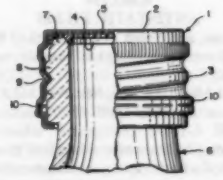
wherein R^1 is a divalent alkylene group and (B) a tackifier; said tackifier being admixed with the polyether in an amount of 10 to 140 parts by weight per 100 parts by weight of said polyether.

4,463,116

EASILY OPENABLE LINER FOR VESSEL CLOSURES

Masayasu Koyama, Zushi; Takashi Yazaki, Hiratsuka, and Isao Tanikawa, Ayase, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,305
Claims priority, application Japan, Nov. 5, 1981, 56-176370
Int. Cl.³ C08K *5/20*
U.S. Cl. 524—232 **6 Claims**



1. An easily openable liner for a vessel closure, said liner comprising an olefin resin or olefin resin composition and as a lubricant a combination of (A) at least one member selected from the group consisting of compounds represented by the formula:

$$R-X \quad (1)$$

wherein R stands for a saturated or unsaturated hydrocarbon group having 3–31 carbon atoms and X stands for an amide group, and (B) at least one member selected from the group consisting of compounds represented by the following formula:

$$R-Y \quad (2)$$

wherein R stands for a saturated or unsaturated aliphatic group having 12–27 carbon atoms and Y stands for a carboxyl group or a hydroxyl group having 8–30 carbon atoms with the proviso that Y is different from X in the formula (1), and that the A/B weight ratio is 5/95 to 95/5.

6. A vessel closure having an easily openable liner, said liner comprising an olefin resin or olefin resin composition and as a lubricant a combination of (a) at least one member selected from the group consisting of compounds represented by the following formula:

$$R-X \quad (1)$$

wherein R stands for a saturated or unsaturated aliphatic hydrocarbon group having 12–22 carbon atoms and X stands for an amide group, and (B) at least one member selected from the group consisting of compounds represented by the following formula:

$$R-Y \quad (2)$$

wherein R is as defined above, and Y stands for a hydroxyl group having 12–30 carbon atoms, with the proviso that Y is different from X in the formula (1), and the A/B weight ratio is 25/75 to 75/25.

4,463,117

HEAT STABLE, POLYMER-FORMING COMPOSITION

Michael J. Malin, Park Ridge, N.J., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 113,480, Jan. 21, 1980, Pat. No. 4,376,839. This application Apr. 19, 1982, Ser. No. 369,486
The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.
Int. Cl.³ C08K *5/32*
U.S. Cl. 524—260 **12 Claims**

1. A heat-stable, polymer-forming adhesive composition comprising:
(a) polymerizable material, an unsaturated polymer containing ethylenic carbon-carbon double bonds;
(b) a transition metal compound derived from a transition element;
(c) a polymer chain terminating antioxidant; and
(d) a preventive antioxidant for decomposing hydroperoxide,

wherein the resulting composition is a stable, storable, pourable liquid which is curable to a solid polymer on initiation of a curing step.

4,463,118

OIL EXTENDED SILICONE ELASTOMER COMPOSITION

Edwin R. Evans, Clifton Park, and John S. Razzano, Cohoes, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 16, 1981, Ser. No. 283,771
Int. Cl.³ C08K *5/54*
U.S. Cl. 524—264 **26 Claims**

1. A curable silicone elastomer composition blend consisting essentially of a silarylenesiloxane copolymer, a dimethylsilicone oil bearing vinyl-type unsaturation for effecting crosslinking of said silarylenesiloxane copolymers with said dimethylsilicone oil, a catalyst and a filler.

4,463,119

MOLDING COMPOSITIONS WHICH ARE BASED ON VINYL CHLORIDE POLYMERS AND SHOW INCREASED WHITE FRACTURE EFFECT

Rainer Mücke, Burgkirchen, and Johann Schiller, Neuötting, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 275,941, Jun. 22, 1981, abandoned. This application May 7, 1982, Ser. No. 375,820

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1980, 3024811

Int. Cl.³ C08L 27/06; B29C 17/00

U.S. Cl. 524—269 6 Claims

1. In the process for producing embossments of contrasting white fracture by cold deforming a plastic sheet, the improvement wherein the plastic sheet is formed from a molding composition consisting essentially of (A) 73.0% by weight to 98.35% by weight of at least one vinyl chloride polymer, (B) 0.05% by weight to 1.5% by weight of at least one solid and/or liquid polyorganosiloxane, said solid polyorganosiloxane having a melting point of not greater than 200° C. and said liquid polyorganosiloxane having a volatility, given as weight loss, of not more than 2.5% by weight after being heated at 230° C. under normal pressure for 15 minutes, (C) 1 to 20% by weight of at least one elastomer selected from the group consisting of acrylonitrile/butadiene/styrene polymers, methyl methacrylate/butadiene/styrene polymers, methyl methacrylate/acrylonitrile/butadiene/styrene polymers, methyl methacrylate/butadiene/styrene polymers, methyl methacrylate/styrene polymers and methyl methacrylate polymers, (D) 0.5 to 3.0% by weight of at least one heat stabilizer for vinyl chloride polymers and (E) 0.1 to 2.5% by weight of at least one lubricant for vinyl chloride polymers, the percentages by weight in each case being relative to the total weight of the molding composition.

4,463,120

PROCESS FOR PREPARING AN AQUEOUS ADHESIVE COMPOSITION

Wendell Collins, Adrian, Mich., and Howard L. Brooks, Sylvania, Ohio, assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Jan. 24, 1983, Ser. No. 460,215

Int. Cl.³ C08L 23/00

U.S. Cl. 524—274 11 Claims

1. A process for preparing an aqueous adhesive composition for bonding unvulcanized rubber compounds together which comprises dispersing a premilled mixture containing rubber selected from the group consisting of natural rubber, synthetic rubber and mixtures thereof, a rubber reinforcing agent in an amount of from about 10 to 40 parts by weight per 100 parts by weight of rubber, a vulcanizing agent in an amount of from about 1 to about 8 parts by weight per 100 parts by weight of rubber, said vulcanizing agent is selected from the group consisting of sulfur, sulfur containing compounds, organic peroxides, metallic oxides, selenium and tellurium and an accelerator that is compatible with the mixture and is selected from the group consisting of mono- and di-sulfides, thiocarbamates, sulfenamides, thiazoles, quanidines, fatty acids having from 10 to 22 carbon atoms and oxides of zinc and magnesium with up to about 600 parts by weight per 100 parts by weight of rubber of an organic solvent for the rubber, said organic solvent is selected from the group consisting of aliphatic hydrocarbons, cyclic hydrocarbons, aromatic hydrocarbons, naphtha and chlorinated hydrocarbons and from about 5 to 70 parts by weight per 100 parts by weight of rubber of a tackifying resin which is soluble in the organic solvent to form a solvent dispersion and thereafter emulsifying the solvent dispersion in the presence of water and sufficient emulsifying agent to form a stable emulsion, said emulsifying agent is selected from the group consisting of anionic, cationic and non-ionic emulsifying agents and mixtures thereof to form an aqueous emulsion.

10. The process of claim 1, wherein the tackifying resin is selected from the group consisting of indene resins, rosins, coumarone resins, oil-soluble phenolic resins, coumarone-indene resins, rosin-polyterpene resins, glycerol esters of hydrogenated rosins, pentaerythritol esters of hydrogenated rosin, hydrogenated rosin, glycerol esters of polymerized rosin, maleic anhydride-modified rosin, rosin derivatives, partial esters of styrene-maleic acid copolymers and chlorinated biphenyls.

4,463,121

THERMOFORMING PARTIALLY CRYSTALLINE POLYESTER ARTICLES

Robert J. Gartland, Youngstown, and Joseph N. Feil, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 18, 1982, Ser. No. 409,219

Int. Cl.³ C08K 5/09

U.S. Cl. 524—291 5 Claims

1. A thermoformed, non-oriented, heat set, thin walled article, the composition consisting of:

(A) from about 98 to about 95 weight percent of polyethylene terephthalate with an intrinsic viscosity as measured in a 60/40 by volume mixed solvent of phenol/tetrachloroethane at 30° C. from about 0.65 to about 1.2; and

(B) from about 2 to about 5 weight percent of a polyolefin with repeat units derived from olefin monomers containing 2 to 6 carbon atoms, said article having a total crystallinity from about 10 to about 30%.

4,463,122

METHOD FOR REDUCING BLOCK OF ETHYLENE INTERPOLYMERS CONTAINING —COOH GROUPS

David P. Flores, and James A. Allen, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

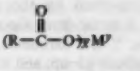
Division of Ser. No. 332,435, Dec. 21, 1981. This application Sep. 27, 1982, Ser. No. 423,960

Int. Cl.³ C08K 5/09

U.S. Cl. 524—322 5 Claims

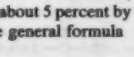
1. A method for reducing the tendency for particles of an interpolymer of ethylene and a polymerizable ethylenically unsaturated monomer containing carboxyl groups to block and stick, which method comprises treating by contacting said particles with sufficient quantities of a solution containing

(1) from about 0.10 to about 5 weight percent of a carboxylic acid salt represented by the general formula



wherein R is a hydrocarbon or hydroxyl-substituted hydrocarbon group; M is a metal selected from Groups I-A or II-A of the Periodic Table; and wherein x=y and each have a value of from 1 to 2 inclusive; and

(2) from about 0.10 to about 5 percent by weight of a carboxylic acid having the general formula



wherein R is as defined in (A) above;

at a temperature of from about 0° C. to about 85° C. for a sufficient time so as to provide the resultant treated particles, after drying, with reduced blocking and/or sticking properties.

4,463,123

METHOD FOR REDUCING BLOCK OF ETHYLENE INTERPOLYMERS CONTAINING —COOH GROUPS

David P. Flores, and James A. Allen, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 332,435, Dec. 21, 1981. This application Sep. 27, 1982, Ser. No. 423,980
Int. Cl.³ C08K 5/09
U.S. Cl. 524—322 5 Claims

1. A method for reducing the tendency for particles of an interpolymer of ethylene and a polymerizable ethylenically unsaturated monomer containing carboxyl groups to block and stick, which method comprises treating by contacting said particles with sufficient quantities of a solution containing

(1) from about 0.10 to about 5 weight percent of an inorganic metal salt represented by the general formula M_aY_b wherein M is a metal from Groups I-A or II-A of the Periodic Table, Y is a carbonate, sulfate, phosphate, nitrate or bicarbonate group, and a and b have values such that will balance the general formula and

(2) from about 0.10 to about 5 weight percent of a solution of a carboxylic acid having the general formula

wherein R is an alkyl group

at a temperature of from about 0° C. to about 85° C. for a sufficient time so as to provide the resultant treated particles, after drying, with reduced blocking and/or sticking properties.

4,463,124

METHOD FOR REDUCING BLOCK OF ETHYLENE INTERPOLYMERS CONTAINING —COOH GROUPS

David P. Flores, and James A. Allen, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 332,435, Dec. 21, 1981. This application Sep. 27, 1982, Ser. No. 423,979
Int. Cl.³ C08K 5/09
U.S. Cl. 524—394 5 Claims

1. A method for reducing the tendency for particles of an interpolymer of ethylene and a polymerizable ethylenically unsaturated monomer containing carboxyl groups to block and stick, which method comprises treating by contacting said particles with sufficient quantities of a solution containing

(1) from about 0.10 to about 5 weight percent of an inorganic metal salt represented by the general formula M_aY_b wherein M is a metal from Groups I-A or II-A of the Periodic Table, Y is a carbonate, sulfate, phosphate, nitrate or bicarbonate group, and a and b have values such that will balance the general formula and

(2) from about 0.10 to about 5 weight percent of a carboxylic acid salt represented by the general formula

wherein R is a hydrocarbon or hydroxyl-substituted hydrocarbon group; M is a metal selected from Groups I-A or II-A of the Periodic Table; and wherein x=y and each have a value of from 1 to 4 inclusive;

at a temperature of from about 0° C. to about 85° C. for a sufficient time so as to provide the resultant treated particles, after drying, with reduced blocking and/or sticking properties.

4,463,125

N-(SUBSTITUTED OXYMETHYL)MELAMINE DERIVATIVES AS SILICA COUPLING AGENTS

Frank W. Stuchal, Bridel, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

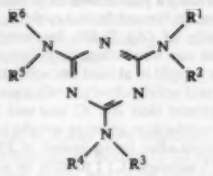
Filed Aug. 18, 1982, Ser. No. 409,232
Int. Cl.³ C08K 3/36
U.S. Cl. 524—566 11 Claims

1. A rubber compound containing a reinforced siliceous filler, consisting essentially of:

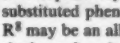
a synthetic or natural elastomer or blend thereof;

the siliceous filler; and

a silica coupling agent having the structure:



where R^1, R^2, R^3, R^4, R^5 and R^6 may be the same or different and are selected from the group consisting of:



where R^7 may be an alkylene or alkenylene having from 1 or 2 respectively to 5 carbon atoms, phenylene, or an alkyl substituted phenylene having from 7 to 11 carbon atoms, R^8 may be an alkyl or alkenyl having from 1 to 2 respectively to 5 carbon atoms, phenyl, or an alkyl substituted phenyl having from 7 to 11 carbon atoms; said silica coupling agent is present in an amount from about 0.5 to 3 phr per 10 of said siliceous filler,

wherein said silica coupling agent promotes reinforcement of said siliceous filler and the 300% modulus of said rubber compound.

4,463,126

COATINGS PREPARED FROM PREPOLYMERS AND AROMATIC DIAMINES HAVING AT LEAST ONE ALKYL SUBSTITUENT IN AN ORTHO POSITION TO EACH AMINO GROUP

Hermann Gruber, Leverkusen, and Wolfgang Wellner, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,339
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203490
Int. Cl.³ C08G 18/10
U.S. Cl. 524—589 4 Claims

1. A process for the production of elastic coatings by coating any substrates with a solvent-free or low solvent coating composition, containing, as binder, a two-component system of (i) a polyisocyanate component and (ii) a hardener component, characterized in that

(i) has an isocyanate content of from 1 to 20% by weight and comprises of at least one prepolymer containing free isocyanate groups based on 1-isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexane and one or more polyalkylene ether polyols having an (average) hydroxyl functionality of from 2 to 3,

(ii) comprises to an extent of at least 50 equivalent percent of polyamines selected from the group consisting of (a) at least one diprimary aromatic diamine having at least one alkyl substituent with 2 to 3 carbon atoms in an ortho-position to each amino group and optionally also methyl substituents in further ortho-positions to the amino groups, (b) reaction products of such diamines with a

sub-equivalent amount of either a prepolymer containing free isocyanate groups based on an organic diisocyanate having a molecular weight of from 168 to 300 and at least one polyalkylene ether polyol having an (average) hydroxyl functionality of 2 to 3 or of a mixture of such a prepolymer with up to 500 isocyanate equivalent percent, based on the isocyanate groups of said prepolymer, of said diisocyanate and (c) mixtures of (a) and (b) and to an extent of up to 50 equivalent percent of dihydric or trihydric alcohols having primary hydroxyl groups

and in that (i) and (ii) being used in quantitative proportions corresponding to an NCO/NH_2 equivalent ratio in the range of from 0,5:1 to 1,5:1.

4,463,127

CROSSLINKABLE GRAFT POLYMER DISPERSION OF ORGANOPOLYSILOXANES CONTAINING HYDROGEN-SILOXANE GROUPS AND SI-VINYL GROUPS

Heinrich Alberts, Cologne, and Helmut Steinberger, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,893

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201194

Int. Cl.³ C08F *283/12*

U.S. Cl. 524—731 **12 Claims**

1. A process for producing a stable graft polymer dispersion comprising polymerizing a mixture comprising by weight approximately

(a) 1 to 99% of an organopolysiloxane mass containing Si-H groups and Si-vinyl groups, and

(b) 99 to 1% of a polymerizable vinyl monomer.

11. A process for producing a stable graft polymer dispersion comprising polymerizing in the presence of a free radical initiator a mixture comprising

(a) 1 to 99% of a mixture of at least two different organopolysiloxanes, and

(b) 99 to 1% of a polymerizable vinyl monomer selected from the group consisting of an olefin, a vinyl ester of an aliphatic or aromatic acid, an α,β-unsaturated monocarboxylic or dicarboxylic acid or an ester, amide, nitrile, anhydride or fluoro-substitution product thereof, a vinyl aromatic, vinyl chloride, vinylidene chloride, vinylidene fluoride, tetrafluoroethylene, perfluoropropylene, an N-alkenoyl-perfluorosulphonamide, a vinyl ether, allyl alcohol, allyl acetate, isobutene diacetate, 2-methylenepropene-1,3-diol, allylethyl carbonate and allylphenyl carbonate,

(c) being made up of about 5 to 85% of an Si-H containing polymethylhydrogensiloxane of the formula

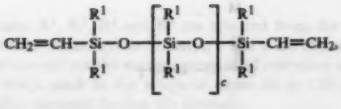
wherein

a denotes an integer between 0 and 120,

b denotes an integer between 0 and 140 and

X denotes a methyl group or hydrogen,

and about 95 to 15% of an Si-vinyl containing polysiloxane of the formula



wherein

R^1 is so chosen from alkyl radicals having 1 to 24 carbon atoms, aryl radicals, vinyl radicals and fluoroalkyl radicals having 1 to 24 carbon atoms that the polymer contains 0.0002 to 3% by weight of vinyl groups and

c has a value which is such that the viscosity of the polymer varies between 100 and 1,000,000 mPa at 25° C.

4,463,128

REACTIVE PLASTISOL DISPERSION

Shiow C. Lin, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed May 9, 1983, Ser. No. 493,035

Int. Cl.³ C08L *29/14*

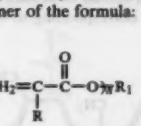
U.S. Cl. 525—59 **11 Claims**

1. A reactive plastisol dispersion comprising

(1) a polyvinyl acetal thermoplast in particle form having a particle size in the range from about 0.1 to about 1,500 microns and

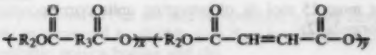
(2) a liquid plasticizer member of the group consisting of

(a) at least one ethylenically unsaturated monomer, oligomer or prepolymer of the formula:



wherein R is H or CH_3, R_1 is an organic moiety and n is 1 or more,

(b) at least one unsaturated polyester containing the group:



wherein R_2 and R_3 are organic moieties, x is 0–20 and y is 1–20; and

(c) a mixture of (a) and (b),

said liquid plasticizer being present in an amount ranging from 50 to 2,000 parts per 100 parts of the thermoplast by weight.

4,463,129

PROCESS FOR IMPROVING ADHESION OF RUBBERY POLYMERS BY REACTING WITH SILANES IN TWO STAGES

Yasukazu Shinada, Yokohama, Japan, and Daniel E. Nerinckx, Tubize, Belgium, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 323,760

Claims priority, application United Kingdom, Nov. 25, 1980, 8037803

Int. Cl.³ C08F *255/06*; C08L *9/00, 23/16*

U.S. Cl. 525—63 **12 Claims**

1. A process for producing a composition having improved adhesion to mineral substrates which comprises in a first stage reacting a rubbery polymer with a reactive silane at elevated temperature; in a second stage mixing the product of the first stage with an epoxy resin as wetting agent; and in a third stage reacting the epoxy containing product of the second stage with a further amount of a reactive silane to form the desired composition wherein said rubbery polymer is selected from the group consisting of halobutyl rubber, ethylene propylene rubber (EPR), ethylene propylene diene rubber (EPDM), and ethylene vinyl acetate copolymer (EVA), wherein said reactive silanes have a first group attached directly or indirectly to the silicon atom which is reactable with the rubbery polymer, and at least one other group attached directly or indirectly to

the silicon atom which is hydrolysable, said reactive silanes in the first and third stages being the same or different.

4,463,130

FLAME-RESISTANT POLYMER MIXTURES

Volker Serini, Krefeld; Horst Peters, Leverkusen; Udo Rudolph, Krefeld; Josef Buekers, Krefeld; Nouvertné, Krefeld, and Dieter Freitag, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,259

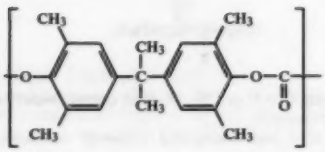
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233614

Int. Cl.[3] **C08L** *51/04, 69/00*

U.S. Cl. 525—67 **1 Claim**

1. Flame-resistant polymer mixtures, characterized in that they contain

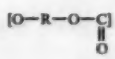
(a) from 5 to 94% by weight of a polycarbonate, the linear chains of which consist of at least 85 mol % of recurring structural units corresponding to formula (1):



(1)

and

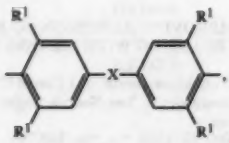
at most 15 mol % of recurring units corresponding to formula (2):



(2)

wherein

—R— represents an o-, m- or p-phenylene radical or a radical of the formula (2a)

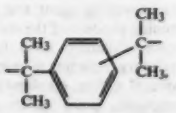


(2a)

wherein

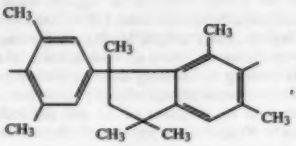
R^1 represents hydrogen, halogen such as chlorine or bromine and C_1–C_3-alkyl and

X represents a C_1–C_5alkylene- or alkylidene radical, a C_3–C_6 cycloalkylene or cycloalkylidene radical, a single bond, —S— or a radical of the formula (2b),



(2b)

in which the two alkyl-substituents can have o-, m- or -position to each other, or represents a radical of the formula (2c)

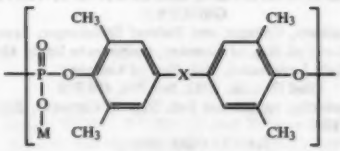


(2c)

whereby units of the formula (1) are not comprised,

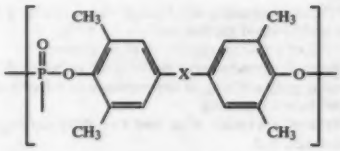
(b) from 94 to 5% by weight of a styrene polymer and/or a graft polymer

(c) from 1 to 35% by weight of a branched polyphosphate which consists of at least 1 mol % of recurring structural units corresponding to formula (3):



(3)

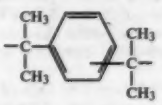
and/or to formula (4):



(4)

wherein

X represents a C_1–C_5 alkylene or alkylidene radical, a C_5–C_6 cycloalkylene or cycloalkylidene radical, a single bond, —S— or



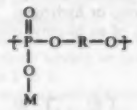
and

M represents H, alkali metal or ½ alkaline earth metal, Y or —R—OH

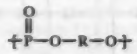
wherein

Y represents an alkyl-, aryl-, cycloalkyl- or aralkyl-radical, and

R is as defined above, and at most 99 mol % of recurring structural units corresponding to formulae (5) and/or (6):



(5)



(6)

wherein

R and M are as defined above, but not including units corresponding to formulae (3) and (4),

(d) from 0 to 20% by weight of one or more organic chloride and/or bromine compounds which contain only aromatically bound chloride and/or bromine, have a decomposition temperature of above 250° C. and do not boil under normal pressure up to at least 300° C.,

(e) from 0 to 1% by weight of polytetrafluoroethylene.

4,463,131
BULK FLOWABLE IMPACT MODIFIERS

Richard J. Grandzol, Doylestown, Pa.; Albert J. McFaull, Sicklerville, N.J.; W. Hunter Wanger, Southampton, Pa., and I. Samuel Rabinovic, La Napouli, France, assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 269,116, Jun. 2, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,150

Int. Cl.³ C08L *51/00, 27/06, 51/06*

U.S. Cl. 525—76 **9 Claims**

1. A resin composition comprising a resin selected from the class consisting of poly(vinyl chloride) and copolymers thereof, polystyrene and poly (methyl methacrylate) and, blended with said resin, from about 1 to about 40 parts, by weight, for each 100 parts of said resin of an impact modifier composition prepared by:

(a) introducing an emulsion of a hard, non-elastomeric containing polymer into a slurry of coagulated impact modifier polymer, coagulating and drying the resultant blend so as to produce impact modifier particles coated with said hard polymer and having improved powder flow, bulk density, and reduced caking tendency, the weight ratio of said hard polymer to impact modifier polymer being from about 0.1:99.9 to about 10:90, said impact modifier polymer being a grafted multistage copolymer having a first, elastomeric stage or trunk polymer and one or more subsequent harder stages or branch polymers, said elastomeric component comprising about 50% to about 90% by weight of the graft copolymer.

4,463,132
COMPOSITION COMPRISING A POLYOLEFIN AND A BLOCK COPOLYMER OF A DIHYDRIC PHENOL MONOMER, A CARBONATE PRECURSOR AND A POLYPHENYLENE OXIDE RESIN

John A. Tyrell, Mt. Vernon, Ind.; Ping Y. Liu, Naperville, Ill., and Gary L. Freimiller, Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

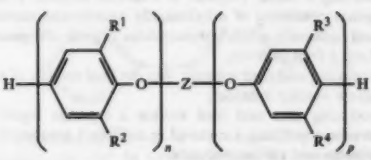
Filed Jun. 15, 1983, Ser. No. 504,443

Int. Cl.³ C08L *71/04, 23/00*

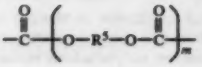
U.S. Cl. 525—92 **11 Claims**

1. A composition which comprises:

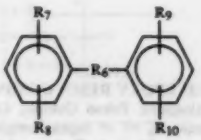
(a) a block copolymer of the formula:



wherein R^1, R^2, R^3 and R^4 are selected from the group consisting of methyl and phenyl; n and p are the same or different and are the average number of repeating units in the block, each in the range of about 40 to 170; Z is a divalent segment having the formula:



wherein R^5 is



wherein R_7, R_8, R_9 and R_{10} are the same or different and are hydrogen, alkyl of one to six carbon atoms, inclusive, chloro or bromo; R_6 is a valence bond, oxa, thio, sulfinyl, sulfonyl, alkylene of two to four carbom atoms, inclusive and

wherein R_{11} and R_{12} are the same or different and are hydrogen or alkyl of one to three carbon atoms, inclusive and m represents the number of repeating units and is in the range of from 1 to 20 in admixture with

(b) a polymer of an alpha-olefin of the formula $RCH{=}CH_2$ wherein R is hydrogen or alkyl of from 1 to 6 carbon atoms,

n and p selected so that the said composition is more compatible as measured by double gate than an admixture of an aromatic polycarbonate and (b).

4,463,133
RUBBER COMPOSITIONS SUITABLE FOR USE IN TIRE TREAD

Yasumasa Takeuchi; Mitsuhiko Sakakibara; Fumio Tsutsumi; Akio Takashima, all of Yokkaichi; Tatsuo Fujimaki, Kodaira; Shinsuke Yamaguchi, Tokyo, and Seisuke Tomita, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited and Japan Synthetic Rubber Co., Ltd., both of Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,371

Claims priority, application Japan, Jun. 3, 1981, 56-85480

Int. Cl.³ C08L *7/00, 9/00, 9/06, 53/02*

U.S. Cl. 525—99 **5 Claims**

1. A rubber composition suitable for use in tire tread containing at least 20 parts by weight of a block copolymer per 100 parts by weight of the total rubber content, said block copolymer comprising (A) a polymer segment obtained by copolymerization of a conjugated diolefin and a monovinyl aromatic hydrocarbon and having a monovinyl aromatic hydrocarbon bond content of not more than 10% by weight and (B) a copolymer segment obtained by copolymerization of a conjugated diolefin and a monovinyl aromatic hydrocarbon and having a monovinyl aromatic hydrocarbon bond content of 15–50% by weight, and satisfying the following conditions:

(i) said block copolymer contains at least 10% by weight of each of said segments (A) and (B);

(ii) the total content of the monovinyl aromatic hydrocarbon bond in said copolymer is 10–40% by weight;

(iii) the average content of the vinyl bond in the conjugated diolefin portion of said block copolymer is 20–70% by weight;

(iv) at least 20% by weight of said block copolymer has a metal-carbon bond in its molecular chain;

(v) said block copolymer has a Moony viscosity ($ML_{1+4}^{100°C}$) of 20–150,

wherein said block copolymer is blended with at least one rubber selected from the group consisting of natural rubber, cis-polyisoprene rubber, polybutadiene rubber, styrene-butadiene copolymer rubber, ethylene-propylene-diene terpolymer rubber and butyl rubber.

4,463,134

MODIFIED EPOXY RESIN COMPOSITION

Minoru Hino, Takatsuki; Takao Oshima, Otsu, and Akihiro Tachibana, Funabashi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Tohto Kasei Co., Ltd., Tokyo, both of, Japan

Filed Dec. 22, 1981, Ser. No. 333,453

Claims priority, application Japan, Oct. 6, 1981, 56-159655

Int. Cl.³ C08F *36/06, 279/02;* **C08L** *63/02*

U.S. Cl. 525—109 **10 Claims**

1. A modified epoxy resin composition, which comprises an epoxy resin and a modified adduct [D] of a conjugated diene polymer or copolymer which has an imido bond and/or amido bond and a semi-ester structure and has an acid value owing to a free carboxyl group of 5 to 100, said modified adduct being obtained by reacting in the absence of an epoxy resin an adduct [A] of a polymer of a conjugated diene having a number average molecular weight of 300 to 20,000 or a copolymer of the conjugated diene and a vinyl monomer with an α,β-unsaturated dicarboxylic acid or its anhydride, with a compound [B] of the formula:

$$R_1—NH_2 \qquad [I]$$

wherein R_1 is an aliphatic hydrocarbon group having 1 to 18 carbon atoms or an alicyclic hydrocarbon group having 3 to 18 carbon atoms, said aliphatic and alicyclic hydrocarbon groups containing optionally an ether bond, and a compound [C] of the formula:

$$R_2—(CH_2)_nOH \qquad [II]$$

wherein R_2 is a saturated or unsaturated hydrocarbon group having 1 to 18 carbon atoms which may optionally contain cyano, a halogen, an ether bond to an ester bond, and n is an integer of from 0 to 3.

4,463,135

PROCESS FOR THE FUNCTIONALIZATION OF POLYSTYRENE RESINS

Neil A. Maly, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 25, 1982, Ser. No. 436,475

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—123 **3 Claims**

1. A process for the functionalization of a halo-methylated polystyrene resin that contains at least 4 percent but more than 75 percent by weight divinylbenzene which comprises (A) contacting said resin in an anhydrous environment with alkyllithium wherein the alkyl radical is of 1 to 12 carbon atoms at a temperature of 0° C.; (B) warming the mixture to ambient temperature and then adding at least one compound selected from the group consisting of: 2,2'-dipyridyl, phenylisocyanate, triphenylphosphine, sulfur, trimethyl borate, 1,2-dibromoethane, N,N-dimethylformamide, cyclopentadiene and carbon dioxide; (C) heating the mixture to reflux and thereafter (D) filtering the mixture to obtain the functionalized resin.

4,463,136

EPIHALOHYDRIN POLYMER BLENDS

James P. Barnhouse, North Ridgeville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 6, 1982, Ser. No. 446,896

Int. Cl.³ C08L *23/06, 71/00, 71/02, 63/00*

U.S. Cl. 525—187 **10 Claims**

1. Composition comprising a blend of a saturated epihalohydrin polymer having molecular weight of up to one million, a polyolefin selected from homopolymers of an alkylene containing 2 to 6 carbon atoms, at least 1 weight percent of an acid acceptor selected from compounds of group IA, IIA, and IVA elements, and at least 1 weight percent of a curing agent consisting of organic peroxide; wherein the polyolefin is solid and has particulate form at ambient conditions before it is blended, and the amount of the polyolefin is about 1 to 50 weight percent, based on the total weight of the epihalohydrin polymer and the polyolefin; the epihalohydrin polymer is selected from homopolymers of an epihalohydrin and copolymers of an epihalohydrin with 20 to 60 weight percent of a monoepoxide containing 2 to 6 carbon atoms.

4,463,137

PROCESS FOR THE PREPARATION OF RUBBER-MODIFIED THERMOPLASTIC RESINS

Christopher L. Bodolus, Cleveland, and William J. Miloscia, Shaker Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 4, 1982, Ser. No. 384,980

Int. Cl.³ C08F *279, /04, 255/02, 255/06, 283/06*

U.S. Cl. 525—316 **21 Claims**

1. A process for the preparation of high acrylonitrile resins in a reactor extruder comprising the sequential steps of:

dissolving a rubber polymer in a solvent selected from the group consisting of ethylenically unsaturated monomers and non-polymerizable organic compounds to form a feed solution;

introducing said feed solution into the feed section of a twin screw reactor extruder;

introducing into said feed section a separate liquid feed stream containing a material in sufficient amount to precipitate said rubber polymer, with the proviso that acrylonitrile be provided in at least one step as said ethylenically unsaturated momomer or said material to precipitate said rubber polymer;

heating said feed solution and feed stream under pressure to a temperature sufficient for polymerization to begin;

polymerizing said monomers around said rubber polymer in said reactor extruder to form a thermoplastic resin; and,

extruding said thermoplastic resin through a die.

13. A process for the preparation of rubber modified thermoplastic resins in a reactor extruder comprising the sequential steps of:

dissolving a rubber polymer in a solvent selected from the group consisting of ethylenically unsaturated monomers and optionally a non-polymerizable organic compound to form a feed solution;

introducing said feed solution into the feed section of a twin screw reactor extruder;

introducing into said feed section a separate liquid feed stream containing a material in sufficient amount to precipitate said rubber polymer;

heating said feed solution and feed stream under pressure to a temperature sufficient for polymerization to begin;

polymerizing said ethylenically unsaturated monomers around said rubber polymer in said reactor extruder to form a thermoplastic resin; and,

extruding said thermoplastic resin through a die.

4,463,138

HIGH MOLECULAR WEIGHT POLY(VINYL ACETATE) AND POLY(VINYL ALCOHOL) AND PROCESSES FOR THEIR PRODUCTION

Tse C. Wu, Morristown, and James C. West, Dover, both of N.J., assignors to Allied Corporation, Morris County, Morris Township, N.J.

Filed Sep. 30, 1982, Ser. No. 429,941
Int. Cl.³ C08F *18/04*
U.S. Cl. 526—319 15 Claims

1. An essentially linear poly(vinyl acetate) which upon alcoholysis and reacetylation has an intrinsic viscosity of at least about 6 dL/g (calculated from measurement of solution viscosity in tetrahydrofuran at 25° C.).

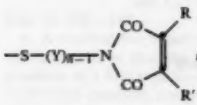
4,463,139

PHOTOCROSSLINKABLE POLYMERS HAVING THIOETHERIMIDYL SIDE GROUPS

Joseph Berger, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

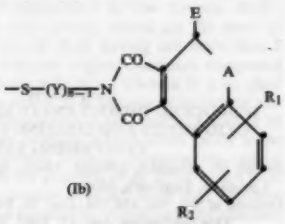
Filed Apr. 18, 1983, Ser. No. 485,934
Claims priority, application Switzerland, Apr. 28, 1982, 2596/82
Int. Cl.³ C08F *8/30, 8/34*
U.S. Cl. 525—329.1 14 Claims

1. A polymer which has an average molecular weight of at least 1,000 and side groups —S—$(Y)_{n-1}$—Im which are of the formulae Ia and/or Ib



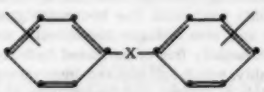
and/or

(Ia)

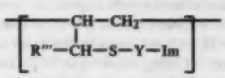


(Ib)

in which R and R′ independently of each other are C_{1-4}—alkyl or together are unsubstituted or methyl-substituted trimethylene or tetramethylene, R_1 and R_2 independently of each other are hydrogen, halogen, C_{1-4}-alkyl or methoxy, A is —CH_2—, —CH_2CH_2— or —OCH_2— where oxygen is bonded to the aromatic ring and E is hydrogen or A is —O— and E is —CH_3, n is 1 or 2 and Y is —C_aH_{2a}— where a = 1–12, C_{3-8}-cycloalkylene, C_{6-10}-arylene, C_{7-8}-aralkylene or -alkylarylene or



where X is a direct bond, —O—, —S— or —CH_2—, and said Y substituents can also be substituted and the group of the formula Ia and/or Ib content is at least 0.5%, based on the number of the polymer's recurring structural elements, said polymer being an addition polymer prepared by incorporating a compound of the formula Z—S—$(Y)_{n-1}$—Im, where Im, n, and Y are as defined above and Z, if n = a, is halogen, and, if n = 2, is hydrogen or halogen, onto a polymer having c=c double bonds, and wherein the resultant addition polymer contains recurring structural elements of the formulae



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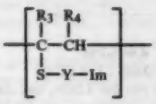

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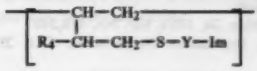

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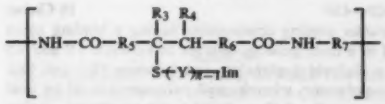

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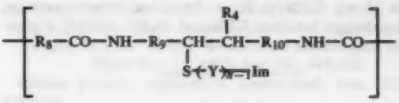

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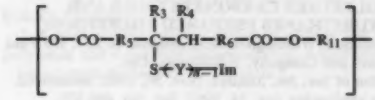
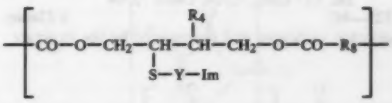
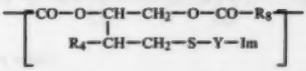


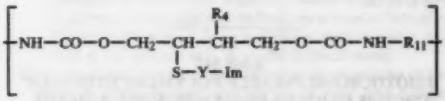
(XII)



(XIII)

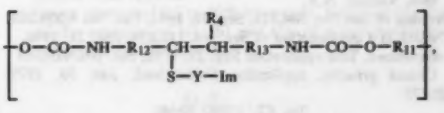


(XIV)



(XV)

or



(XVI)

where R‴ is hydrogen or OH, R_3 is hydrogen, methyl or halogen, R_4 is hydrogen or halogen, R_5 and R_6 are independently a direct bond or —CH_2—, or one of R_5 and R_6 is a direct bond and the other is —CH=CH— or $(CH_2)_3$, R_7 is the radical of an aromatic diamine or the radical of an aliphatic diamine which has or has not c=c double bonds and has up to 16

carbon atoms, R_9 is the radical of an aromatic dicarboxylic acid or the radical of an aliphatic dicarboxylic acid which has or has not c=c double bonds and containing at least 6 carbon atoms, R_9 and R_{10} are independently substituted or unsubstituted aliphatic radicals, which have or have not c=c double bonds, and have a total of 4–12 carbon atoms in the main chains, R_{11} is a benzene radical or $-C_qH_{2q}-$ where q is 2–10, and R_{12} and R_{13} are independently $-(CH_2)_r$ where r is 1–5.

4,463,140

POWDER COATING

Eimbert G. Belder; Robert van der Linde, and Jan Schippers, all of Zwolle, Netherlands, assignors to DSM Resins B.V., Zwolle, Netherlands

Filed Mar. 24, 1983, Ser. No. 478,545

Claims priority, application Netherlands, Oct. 29, 1982, 8204206

Int. Cl.³ C08G 63/76

U.S. Cl. 525—438 **18 Claims**

1. A powder coating composition having a binding agent composed of a homogeneous mixture of between 1.9 and 9.0 wt.% of a diglycidyl phthalate and between 91.0 and 98.1 wt.% of a polyester, wherein said polyester has (a) an acid number between 10 and 30 mg KOH/g, (b) a hydroxyl number less than 15 mg KOH/g, (c) a theoretical number-average molecular weight between 3,750 and 12,500 and (d) a glass transition temperature between 48° and 85° C.

4,463,141

POLYETHER CARBONATE DIOLS AND POLYURETHANES PREPARED THEREFROM

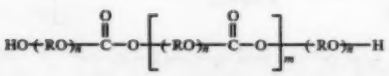
Ivan M. Robinson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 326,042, Nov. 30, 1981, abandoned. This application Jan. 24, 1983, Ser. No. 460,570

Int. Cl.³ C08L 75/08; C08G 71/04

U.S. Cl. 525—467 **6 Claims**

1. A polyether carbonate diol represented by the structure



where

R is $-CH_2-_4$

n is 7–45, and

m is 0–18.

4,463,142

PHOTOCROSSLINKABLE POLYMERS WITH SIDE GROUPS DERIVED FROM INDENONE AND THE PREPARATION AND USE OF THESE POLYMERS

Hans Zweifel, Basel; Joseph Berger, Marly, and Hans Bosshard, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

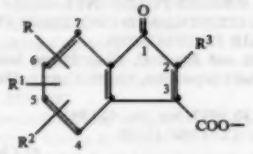
Division of Ser. No. 304,521, Sep. 21, 1981, Pat. No. 4,399,259, which is a continuation of Ser. No. 113,834, Jan. 21, 1980, abandoned. This application Sep. 17, 1982, Ser. No. 419,385

Claims priority, application Switzerland, Jan. 30, 1979, 886/79

Int. Cl.³ C08G 59/40

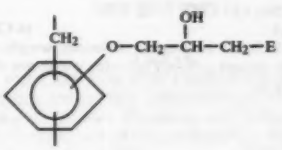
U.S. Cl. 525—502 **1 Claim**

1. A polymer, crosslinkable under the action of light, which has an average molecular weight between 1,000 and 100,000, as measured by the intrinsic viscosity of a solution of said polymer in N,N-dimethylformamide at 20° C., and which has side groups of the formula I



(I)

in which R^3 is Cl or Br, and R, R^1 and R^2 are identical or different and R is a n-alkyl radical having 1 to 4 C atoms, or is H, Cl, Br or F, R^1 is an n-alkyl radical having 1 to 4 C atoms, or is H, and R^2 is H or CH_3, or R^1 and R^2 together are the group $-CH_2CH_2CH_2-$, with the proviso that in the latter case the bond to the six-membered ring is via the C atoms in the 5-position and 6-position of the nucleus, the proportion of groups of the formula I being at least 5%, based on the number recurring structural elements of the polymer, said polymer being derived from an epoxy novolac, wherein said polymer contains recurring structural elements of the formula X



(X)

in which the radical E has the formula I.

4,463,143

DIBLOCKED DIISOCYANATE UREA URETHANE OLIGOMERS AND COATING COMPOSITIONS COMPRISING SAME

Joseph W. Holubka, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 334,794, Dec. 28, 1981, Pat. No. 4,409,381. This application Apr. 11, 1983, Ser. No. 472,800

Int. Cl.³ C08L 63/00; C08G 18/32, 18/80

U.S. Cl. 525—528 **20 Claims**

1. A solvent based resin composition comprising:

A. a chain-extendable, crosslinkable diblocked diisocyanate urea urethane oligomer of molecular weight about 300 to about 5000 comprising the reaction product of primary or secondary alkanolamine of molecular weight about 60 to about 700 with half-blocked diisocyanate of molecular weight about 120 to about 2000, in molar ratio of about 1:2, respectively, whereby both the hydroxy and amine functionality react with free isocyanate groups to form urethane and urea linkages respectively, said oligomer being substantially free of unreacted hydroxy and amino functionality, which half-blocked diisocyanate is the reaction product of organic diisocyanate with monofunctional blocking agent, wherein said diblocked diisocyanate urea urethane oligomer has a de-blocking temperature of about 120° C. to about 250° C.;

B. polyepoxide bearing about 2 to about 10 epoxide groups and having molecular weight of about 100 to about 1000, wherein said oligomer and said polyepoxide are present in a weight ratio of from about 1:1 to about 10:1, respectively; and

C. organic solvent.

4,463,144
PROCESS FOR PRODUCING PROPYLENE-TETRAFLUOROETHYLENE COPOLYMER

Gen Kojima, Machida, and Michio Hisasue, Yokohama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 185,744, Sep. 10, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 357,812

Int. Cl.³ C08F 2/26, 4/40

U.S. Cl. 526—94 12 Claims

1. A process for preparing a propylene-tetrafluoroethylene copolymer, comprising; copolymerizing tetrafluoroethylene and propylene in a molar ratio ranging from 95/5 to 40/60 in an aqueous medium containing tertiary butanol ranging from 5 to 30 wt.%, an emulsifier ranging from 0.01 to 10 wt.% and a redox catalyst system of (1) a water soluble persulfate, (2) a water soluble iron salt, (3) a hydroxymethanesulfinate and (4) ethylenediamine-tetraacetic acid or salt thereof at a pH of 8 to 10.5 and at a temperature of 0° to 50° C.

4,463,145
METHOD FOR HOMO- OR CO-POLYMERIZATION OF α-OLEFIN

Yoichi Sunada, Shin-nanyo; Yoshikazu Takahashi, Hikari, and Masaru Takitani, Shin-nanyo, all of Japan, assignors to Toyo Stauffer Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 161,334, Jun. 20, 1980, Pat. No. 4,329,251. This application Jan. 8, 1982, Ser. No. 338,109

Claims priority, application Japan, Jun. 29, 1979, 54-83220

Int. Cl.³ C08F 4/64, 10/06

U.S. Cl. 526—142 8 Claims

1. A method for homo- or copolymerization of an α-olefin characterized in that the polymerization is conducted in the presence of a first organo-aluminum compound and a titanium trichloride catalytic component in the form of uniform particles having an average diameter between 10 and 500μ which is prepared by dissolving (1) titanium tetrachloride, (2) an organic ether compound represented by the formula ROR′, wherein R and R′ are alkyl groups which are the same or different with at least one of them having not more than 5 carbon atoms, and (3) a second organo-aluminum compound represented by the formula AlR_nX_{3-n} wherein R is an alkyl group of 1 to 10 carbon atoms, X is halogen or hydrogen and $0<n\leqq3$, in a mixed solvent which is prepared by allowing 20 to 70% by volume of an aromatic hydrocarbon halide to be concomitant with a saturated aliphatic hydrocarbon and/or alicyclic hydrocarbon in the presence of an olefin which is an aliphatic unsaturated hydrocarbon of not more than 6 carbon atoms; said second organo-aluminum compound, said titanium tetrachloride and said organic ether compound being added to said mixed solvent at a solvent temperature not exceeding 55° C.; thereafter, increasing the solvent temperature to a value between 45° and 150° C. over a period between 10 minutes and 24 hours and, during the process of increasing the temperature, adding an additional amount of said organic ether compound and/or said titanium tetrachloride to said solution, to produce said titanium trichloride catalytic component which is then separated from said solution in the presence of said olefin to produce said titanium trichloride catalytic component in the form of uniform particles having a desired average diameter between 10 and 500μ.

4,463,146
SYNDIOTACTIC 1,2-POLYBUTADIENE SYNTHESIS PROCESS

Ken W. Dunbar; John J. Barbour, both of Akron; James N. Henderson, Hudson, and Anthony J. Bell, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 23, 1982, Ser. No. 452,664

Int. Cl.³ C08F 4/70, 36/06

U.S. Cl. 526—142 20 Claims

1. A process for producing polybutadiene composed essentially of syndiotactic 1,2-polybutadiene in a tetrahydrofuran polymerization medium comprising polymerizing 1,3-butadiene in said tetrahydrofuran polymerization medium in the presence of (I) a catalyst composition microencapsulated in a polyene product which contains (a) at least one cobalt compound selected from the group consisting of (i) β-diketone complexes of cobalt, (ii) β-keto acid ester complexes of cobalt, (iii) cobalt salts of organic carboxylic acids having 6 to 15 carbon atoms, and (iv) complexes of halogenated cobalt compounds of the formula CoX_n, wherein X represents a halogen atom and n represents 2 or 3, with an organic compound selected from the group consisting of tertiary amines, alcohols, tertiary phosphines, ketones and N,N-dialkylamides, and (b) at least one organoaluminum compound of the formula AlR_3, wherein R represents a hydrocarbon radical of 1 to 6 carbon atoms; and (2) carbon disulfide.

4,463,147
HEAT-CURABLE MIXTURES, STABLE ON STORAGE, BASED ON POLYIMIDES AND CONTAINING POLYMERIZATION CATALYSTS

Hermann Diethelm, Aesch, and Abdul-Cader Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,023

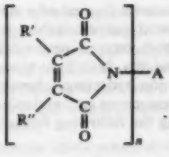
Claims priority, application Switzerland, Dec. 23, 1981, 8253/81

Int. Cl.³ C08F 22/40

U.S. Cl. 526—262 18 Claims

1. A heat-curable mixture, stable on storage and based on a polyimide and a polymerization catalyst, which comprises

(a) a polymaleimide of the formula I



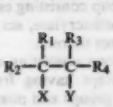
(I)

in which

R′ and R″ are a hydrogen atom or a linear or branched alkyl group having 1 to 4 C atoms and A is a divalent, trivalent or tetravalent aliphatic radical having 2 to 30 C atoms, a cycloaliphatic radical, an aromatic radical, a heterocyclic radical or an araliphatic radical and n is 2, 3 or 4, or, when n is 2, A is also a direct bond,

(b) a compound having at least two functional groups of the same or different type and having at least one olefinic double bond in the molecule, which compound undergoes an addition or polymerization reaction with the maleic double bond, or a still fusible prepolymer of such a component with (a), and

(c) in an amount of 0.1 to 10% by weight, based on the sum of the amounts of (a), (b) and (c), of a polymerization catalyst of the formula II



(II)

in which R_1 and R_3 are each an aromatic radical, R_2 is a hydrogen atom or an aliphatic or aromatic radical, R_4 is an aliphatic or aromatic radical and X and Y, independently

of one another, are each a free or masked hydroxyl group or a halogen atom.

4,463,148

CONTACT LENS AND COMPOSITIONS

Peter Höfer, Aschaffenburg; Ulrich Müller, Johannesberg; Manfred Bärenz, Dreieich; Horst Schäfer, and Wolfgang Müller-Lierheim, both of Aschaffenburg, all of Fed. Rep. of Germany, assignors to Titmus Eurocon Kontaktlinsen GmbH KG & Co., Aschaffenburg, Fed. Rep. of Germany

Continuation of Ser. No. 226,674, Jan. 21, 1981, abandoned. This application May 6, 1983, Ser. No. 490,209

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002664

Int. Cl.³ C08F *220/20*; G02C *7/04*

U.S. Cl. 526—264 **6 Claims**

1. A soft contact lens comprising a copolymer, consisting of 50% to 90% hydroxy-ethyl-methacrylate (HEMA) by weight, 2% to 20% of one or more unsaturated carboxylic acids selected from the group consisting of acrylic acid and methacrylic acid, 2% to 20% one or more basic monomers selected from the group consisting of acrylamide, methacrylamide, dimethylaminoethyl methacrylate, dimethylaminopropyl methacrylate, N-vinyl-pyrrolidone and N-vinyl-delta-lactam, 5% to 25% of an aliphatic ester of acrylic acid or methacrylic acid and 0.1% to 1% of at least one dialkylene-glycol-dimethacrylate cross-linker selected from the group consisting of ethylene-diethylene-dipropylene-, and triethylene-glycol-dimethyacrylate.

4,463,149

SILICONE-CONTAINING CONTACT LENS MATERIAL AND CONTACT LENSES MADE THEREOF

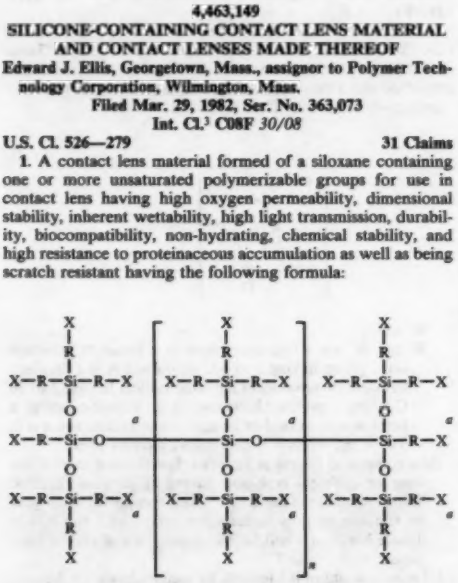
Edward J. Ellis, Georgetown, Mass., assignor to Polymer Technology Corporation, Wilmington, Mass.

Filed Mar. 29, 1982, Ser. No. 363,073

Int. Cl.³ C08F *30/08*

U.S. Cl. 526—279 **31 Claims**

1. A contact lens material formed of a siloxane containing one or more unsaturated polymerizable groups for use in contact lens having high oxygen permeability, dimensional stability, inherent wettability, high light transmission, durability, biocompatibility, non-hydrating, chemical stability, and high resistance to proteinaceous accumulation as well as being scratch resistant having the following formula:



wherein:

X is selected from the group consisting essentially of unsaturated polymerizable methacrylate, acrylate, hydrogen or "Z" groups and mixtures thereof,

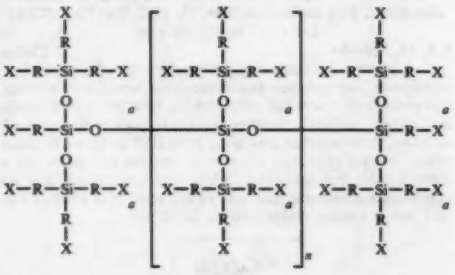
R is selected from the group consisting essentially of alkylene, cycloalkylene groups having from 1 to about 10 carbon atoms, arylene groups and mixtures thereof,

a is an integer from 0 to about 10 where each "a" may be the same or different,

n is an integer from 0 to about 10,

Z groups are selected from the group consisting essentially of acetoxy, carbomethoxy, glycidoxy, glyceryl, and carboxy with at least one "X" being a "Z" group.

26. A contact lens formed of a siloxane containing one or more unsaturated polymerizable groups having the following formula:



wherein:

X is selected from the group consisting essentially of unsaturated polymerizable methacrylate, acrylate, hydrogen or "Z" groups and mixtures thereof,

R is selected from the group consisting essentially of alkylene, cycloalkylene groups having from 1 to about 10 carbon atoms, arylene groups and mixtures thereof,

a is an integer from 0 to about 10 where each "a" may be the same or different,

n is an integer from 0 to about 10,

Z groups are selected from the group consisting essentially of acetoxy, carbomethoxy, glycidoxy, glyceryl, and carboxy with at least one "X" being a "Z" group.

4,463,150

ACRYLIC OR METHACRYLIC TERMINATED OLIGOMERS

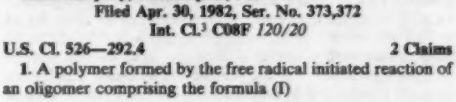
Everett J. Kelley, Moorestown, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 30, 1982, Ser. No. 373,372

Int. Cl.³ C08F *120/20*

U.S. Cl. 526—292.4 **2 Claims**

1. A polymer formed by the free radical initiated reaction of an oligomer comprising the formula (I)



wherein n is greater than or equal to 2;

R=—H, —CH_3, or —C_2H_5;

R′, R″=—H, —CH_3, —C_2H_5, —CH_2Cl, —CH_2Br, —C_6H_5, —$CH_2OCOCH{=}CH_2$, —$CH_2OCOC(CH_3){=}CH_2$, —$CH_2OCH_2CH{=}CH_2$, —$CH_2OC_6H_5$, or —$CH_2OC_4H_9$, or R′ plus R″ form a cyclic ring —C_4H_8—; and

R‴=—H or —C_2H_4OH.

4,463,151

PROCESS FOR THE FORMATION OF NOVEL ACRYLAMIDE ACRYLATE COPOLYMERS

Donald N. Schulz, Annandale; John J. Maurer, New Providence, and Jan Bock, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 29, 1982, Ser. No. 454,285

Int. Cl.³ C08F *220/56*

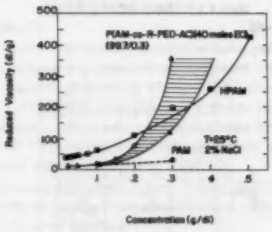
U.S. Cl. 526—307.5 **8 Claims**

1. A free radical copolymerization process for the formation

of a water soluble copolymer of acrylamide/alkyl poly(etheroxy)acrylate which comprises the steps of:

(a) forming an aqueous reaction solution from a water soluble acrylamide monomer, deoxygenated water under a nitrogen atmosphere and a water soluble alkyl poly(etheroxy)acrylate;

(b) heating said reaction solution to at least 50° C.;



(c) adding sufficient free radical initiator to said reaction solution to initiate copolymerization of said acrylamide monomer and said alkyl poly(etheroxy)acrylate monomer; and

(d) polymerizing said acrylamide monomer and said alkyl poly(etheroxy)acrylate monomer in said reaction solution for a sufficient period of time, at a sufficient temperature to form said copolymer.

4,463,152

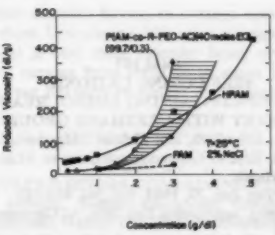
ACRYLAMIDE ACRYLATE COPOLYMERS

Donald N. Schulz, Annandale; John J. Maurer, New Providence, and Jan Bock, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

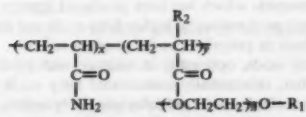
Filed Dec. 29, 1982, Ser. No. 454,286

Int. Cl.³ C08F *220/56*

U.S. Cl. 526—307.5 **9 Claims**



1. A water soluble copolymer having the formula which comprises:



wherein R_1 is selected from the group consisting of C_1 to C_{20} alkyl groups, C_6 to C_{20} aryl groups and C_6 to C_{30} alkylaryl groups; R_2 is hydrogen or a methyl group, n is about 1 to 60; y is about 0.010 to about 5.00 mole %, and x is about 95.00 to about 99.99 mole %.

4,463,153

HEAT SHRINKABLE FILM AND PROCESS FOR PREPARING THE SAME

Tomoji Mizutani; Hitoshi Fukushima, and Yoshihiro Sakamoto, all of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 177,185, Aug. 11, 1980, Pat. No. 4,354,997. This application Feb. 19, 1982, Ser. No. 350,376

Claims priority, application Japan, Aug. 20, 1979, 54-105067

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.³ C08J *5/18*

U.S. Cl. 526—348.1 **4 Claims**

1. A heat shrinkable film which is a biaxially stretched film of a non-crosslinked ethylene polymer and which has a heat shrinkage percent of not less than 25% and a heat shrinkage stress of not less than 12 kg./cm.², respectively at a temperature of 15° C. below the melting point of the ethylene polymer and has a bar heat seal strength of not less than 900 g./10 mm. in width and an impact strength of beads sealed portion of not less than about 5 kg.cm., said ethylene polymer being a copolymer of ethylene and an α-olefinically unsaturated monomer and having a density of 0.91 to 0.93 g./cm.³ at 25° C.

4,463,154

POLYURETHANE POWDER ENAMELS FREE OF CLEAVAGE PRODUCTS AS WELL AS ENAMEL COATINGS PRODUCED FROM SUCH POWDERS

Josef Disteldorf, Herne; Rainer Gras, Bochum; Horst Schnurbusch; Werner Hübel, both of Herne, and Elmar Wolf, Recklinghausen, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 292,712, Aug. 13, 1981, abandoned. This application Jan. 25, 1983, Ser. No. 460,942

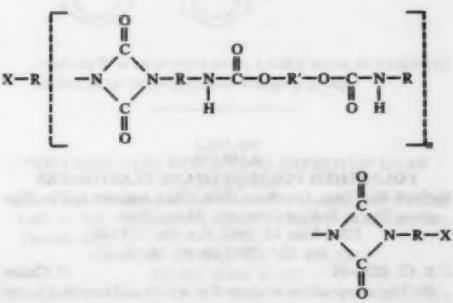
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030539

Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 **14 Claims**

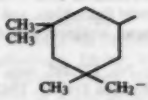
1. A process for preparing polyurethane powder enamles free of cleavage products selected from monoalcohols, primary or secondary amines, having good storage stability, which are curable above 120° C., and which are linear polyisocyanate addition products which are irreversibly, partially or completely, blocked and which contain uretidinedione groups, characterized in that,

a. linear isophorone diisocyanate-diol polyaddition adducts which are irreversibly, partially or completely, blocked with terminal monoalcohols or monoamines and which contain uretidinedione groups, whose uretidinedione groups are essentially free from isocyanurate groups and are derived from isophorone diisocyanate which can be more than 98% decomposed back into isophorone diisocyanate by heating, having the following formula:

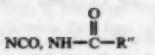


wherein

R=



X=



R'=a divalent aliphatic, cycloaliphatic, aromatic or araliphatic hydrocarbon radical of a diol, n>1,

R"=a monoalcohol radical or primary or secondary monoamine radical having 1-30 C-atoms, having an NCO/OH ratio or uretidinedione dimer of isophorone diisocyanate to diol of 1:0.5 to 1:0.9, preferably 1:0.6 to 1:0.8, a uretidinedione/diol molar ratio between 2:1 and 6:5, preferably 3:2 to 5:4, a molecular weight between 550 and 4300, preferably between 1500 and 2000, and a melting point of ≧70° C. to ≦130° C., preferably 80° C. to 120° C.,

b. polyhydroxy compounds having an OH functionality of ≧3.4 to ≦7, preferably 3.7 to 4.5, an average molecular weight of 2000 to 5000, preferably 2500 to 4500, a hydroxyl number between 30 and 100 mg KOH/g, preferably between 40 and 80 mg KOH/g, a viscosity of <100,000 mPa s preferably <40,000 mPa s at 160° C. and a melting point of ≦70° C. to ≦120° C., preferably 75° C. to 100° C., and

c. the additives customary in polyurethane chemistry, are reacted, wherein the molar ratio of a. and b. is selected so that the NCO/OH ratio is 0.8:1 to 1.2:1.

4,463,155

POLYETHER POLYURETHANE ELASTOMERS

Richard W. Kibler, Cuyahoga Falls, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 13, 1982, Ser. No. 377,742

Int. Cl.³ C08G *18/48, 18/32*

U.S. Cl. 528—61 **15 Claims**

10. The composition of claim 9 in which said complex is one of three molecules of methylene dianiline per molecule of NaCl.

4,463,156

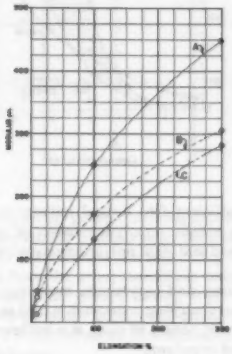
POLYURETHANE ELASTOMER AND AN IMPROVED HYPOALLERGENIC POLYURETHANE FLEXIBLE GLOVE PREPARED THEREFROM

Charles W. McGary, Jr., Centerville; Vincent J. Pascarella, Dayton; Delmer R. Rhodes, and Robert A. Taller, both of Centerville, all of Ohio, assignors to Warner-Lambert Co., Inc., Morris Plains, N.J.

Filed Mar. 15, 1982, Ser. No. 357,912

Int. Cl.³ C08G *22/10, 53/08*

U.S. Cl. 528—65 **42 Claims**



1. A flexible glove made from a polyurethane having 100% modulus less than approximately 250 psi, a 300% modulus of 200 to 450 psi, initial tensile set less than approximately 30% and tesile strength of approximately 3500 to 6500 psi.

4,463,157

SELF CURING CATIONIC AMIDE-GROUP-CONTAINING AMINOUREA RESIN, IF NECESSARY WITH URETHANE GROUPINGS

Hilde Kersten, Erlenbach, and Helmut Mägerlein, Obernburg, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands

Filed Jan. 20, 1983, Ser. No. 459,623

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201565

Int. Cl.³ C08G *18/38*

U.S. Cl. 528—68 **11 Claims**

1. Self-curing cationic amide-group-containing aminourea resin, optionally with urethane groupings, comprising the reaction product of at least

(A) a polyaminoamide which has been produced from

(1) one or more predominantly higher fatty acids and one or more alkylene or polyalkylene-polyamines and/or

(2) dimer fatty acids, optionally in mixture with predominantly higher, substantially unsaturated fatty acids, and one or more alkylene- or polyalkylene -polyamines, and said polyaminoamide additionally partially contains cyclic amidine-groupings produced under splitting off of water and, optionally, amino-groups blocked by ketimine, and

(B) a diisocyanate

and which have been made dispersible in water with an acid under formation of cationic groupings.

4,463,158
MODIFIED POLYURETHANE LIQUID POLYMER COMPOSITIONS

James M. O'Connor, Clinton; Donald L. Lickel, Wallingford, and Michael L. Rosin, Madison, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 364,575, Apr. 1, 1982, which is a continuation-in-part of Ser. No. 203,213, Nov. 3, 1980, abandoned. This application Jun. 20, 1983, Ser. No. 506,179

Int. Cl.³ C08G 18/10, 18/67

U.S. Cl. 528—75 4 Claims

1. A process for preparing a polyurethane polymer product comprising mixing a polyurethane oligomer and a heat activated free radical generating catalyst, and then heating said mixture at a temperature adequate to activate said catalyst and cure said mixture, said polyurethane oligomer having an equivalent ratio of NCO to active hydrogen from about 0.5/1 to about 2/1 and being prepared by reacting

(a) an isocyanate-terminated prepolymer having a final free NCO content ranging from about 0.5% to about 30% which is the product of reacting
  (1) an organic polyisocyanate with
  (2) an isocyanate reactive group-containing unsaturated monomer selected from the group consisting of
    (i) hydroxyalkyl acrylates,
    (ii) hydroxyalkyl methacrylates,
    (iii) hydroxyalkyl acrylamides,
    (iv) hydroxyalkyl methacrylamides,
    (v) aminoalkyl acrylates,
    (vi) aminoalkyl methacrylates,
    (vii) aminoalkyl acrylamides,
    (viii) aminoalkyl methacrylamides, and
    (ix) mixtures thereof,
  wherein alkyl is ethyl or propyl, with

(b) a polyol reactant comprising
  (1) a high functionality polyol having an average equivalent weight of from about 75 to about 500 and an average functionality of at least about 3, said high functionality polyol being prepared by reacting an alkylene oxide, or a mixture of alkylene oxides, with a polyhydric initiator comprising a carbohydrate or a carbohydrate derivative, and
  (2) a chain extender having an average equivalent weight from about 31 to about 4,000 and an average functionality of about 2, said chain extender being employed in an amount ranging from about 20 to about 1,500 parts by weight per 100 parts by weight of said high functionality polyol.

4,463,159
POLYARYLENE ESTERS CONTAINING PHOSPHORUS

Siegmund Besecke, Seeheim-Jugenheim; Guenter Schroeder, Ober-Ramstadt; Werner Ude, Darmstadt-Arheilgen, and Winfried Wunderlich, Rossdorf, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,526

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222571

Int. Cl.³ C08G 63/68

U.S. Cl. 528—167 8 Claims

1. A polyarylene ester polymer of the formula

$$\text{—[O—A—O—CO—B—CO]}_n\text{—}$$

said polymer having a phosphorus content greater than 1 percent by weight and having terminal groups which are hydroxyl or carboxyl groups, or are groups obtainable by reaction of said polymer with a monofunctional phenol or carboxylic acid, wherein

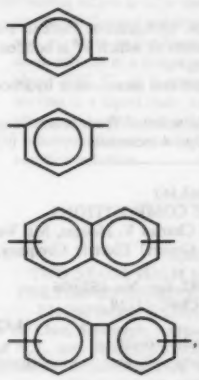
n has a mean value over 20;

A represents at least in part a group of the structure

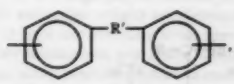
wherein R represents lower alkyl, chlorinated lower alkyl, aryl, aryl substituted by methyl or halogen, or aralkyl, and x is 0 or 1, and the rest, if any, of A comprises at least one member selected from the group of groups of the structure given below for B or the structure

wherein R″ is a difunctional hydrocarbon group which contains from 5 to 15 carbon atoms and a number of hydrogen atoms which is at most equal in number to the number of carbon atoms; and

group B represents bivalent aromatic groups having at least two different structures of the formulas



or is at least one group with the structure



wherein R′ is an oxygen atom, a sulfur atom, or a sulfonyl, carbonyl, or isopropylidene bridging group.

4,463,160
POLYARYLATES EXHIBITING IMPROVED HEAT RESISTANCE

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

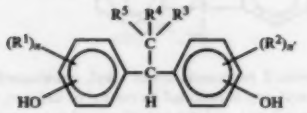
Filed Dec. 17, 1982, Ser. No. 451,106

Int. Cl.³ C08G 63/18

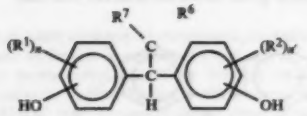
U.S. Cl. 528—176 25 Claims

1. Polyarylate resin exhibiting improved heat resistance prepared by reacting

(a) at least one aromatic dicarboxylic acid or an ester forming reactive derivative thereof; and
(b) at least one dihydric phenol selected from dihydric phenols represented by the general formulae



and



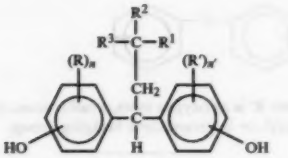
wherein:
each R^1 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals;
each R^2 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals;
R^3, R^4 and R^5 are independently selected from monovalent hydrocarbon radicals;
R^6 is selected from divalent hydrocarbon radicals that together with the carbon atom to which R^6 is bonded form a cycloaliphatic structure;
R^7 is selected from hydrogen and monovalent hydrocarbon radicals; and
n and n' are independently selected from whole numbers having a value of from 0 to 4 inclusive.

4,463,161
POLYARYLATE COMPOSITIONS

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 27, 1982, Ser. No. 452,906
Int. Cl.³ C08G 63/18
U.S. Cl. 528—176 **11 Claims**

1. Polyarylate resin prepared by reacting
(i) at least one aromatic dicarboxylic acid or a reactive derivative thereof; and
(ii) at least one dihydric phenol represented by the general formula



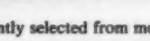
wherein:
R is independently selected from halogen radicals and monovalent hydrocarbon radicals;
R' is independently selected from halogen radicals and monovalent hydrocarbon radicals;
R^1 is selected from hydrogen and alkyl radicals;
R^3 is selected from hydrogen and alkyl radicals;
R^2 is selected from alkyl radicals, with the proviso that if both R^1 and R^3 are hydrogen then R^2 is selected from branched alkyl radicals containing at least three carbon atoms; and
n and n' are independently selected from whole numbers having a value of from 0 to 4 inclusive.

4,463,162
POLYNUCLEAR FUSED AROMATIC RING TYPE POLYMER AND PREPARATION THEREOF

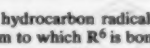
Sumitaka Nogami, Yokohama; Tsuneo Wakabayashi, Ise; Elichi Oono; Yoshiharu Kitahama, both of Kawasaki, and Isamu Iwami, Zushi, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Dec. 4, 1981, Ser. No. 327,724
Claims priority, application Japan, Dec. 9, 1980, 55-172545; Dec. 9, 1980, 55-172546; Dec. 12, 1980, 55-174717
Int. Cl.³ C08G 63/18
U.S. Cl. 528—190 **41 Claims**

1. A condensation polymer having a reduced specific viscosity of 0.1–1.5 at 30° C. of a 1% by weight solution in tetrachloroethane, comprising recurring units of the formula (I) or (II):

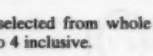


(I),



(II)

wherein X represents an aryldioxyl group of the formula: —O—AR—O— wherein Ar is an anthracene unit, X' represents a C_{6-13} hydrocarbylenedioxyl group, Y and Y' represents (a) a C_{4-8} hydrocarbylene group or (b) a C_{6-16} dicarboxylic acid residue of the formula:



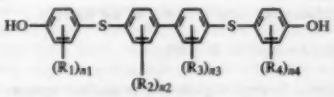
wherein R^2 is a C_{4-14} alkylene group or a phenylene group, and Y is different from Y', the content of Ar being about 10 to about 80% by weight based on the total weight of the condensation polymer.

4,463,163
POLYCARBONATE FROM 4,4'-BIS (4-HYDROXYPHENYL THIO)BIPHENYLS

Sivaram Krishnan, Moers, Fed. Rep. of Germany, and John R. Sanderson, Austin, Tex., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 1, 1982, Ser. No. 383,893
Int. Cl.³ C08G 63/62
U.S. Cl. 528—196 **4 Claims**

1. A process for preparing an aromatic copolycarbonate resin comprising reacting a monomer of the structural formula



wherein R_1, R_2, R_3 and R_4 independently are C_1–C_4-alkyl, chlorine or bromine and n_1, n_2, n_3 and n_4 independently are 0, 1 or 2, with a member selected from the group consisting of carbonyl bromide, phosgene, bischloroformic ester of said monomer and diaryl carbonate.

4,463,164

PROCESS FOR PREPARING POLYPHENYLENE ETHERS

William O. Dalton; Michael K. Rinehart, both of Parkersburg, W. Va., and Akitoshi Sugio, Tokyo, Japan, assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Feb. 15, 1983, Ser. No. 466,746

Int. Cl.³ C08G 65/46

U.S. Cl. 528—212 20 Claims

1. A process for producing a polyphenylene ether comprising the steps of:

a. oxidatively coupling monohydric phenols in a polymerization reactor in the presence of a complex catalyst comprising a copper salt and an amine in a liquid medium immiscible with water, said liquid medium being a solvent for said monohydric phenols and a poor solvent for said polyphenylene ether, and allowing the polyphenylene ether to precipitate to form a slurry in said medium;

b. washing said slurry with an aqueous solution comprising water and from 0.05 to 5 wt% of a chelating agent; and

c. separating the aqueous solution from said slurry.

4,463,165

WATER-DISPERSIBLE POLYESTER, ITS PREPARATION, AND ITS USE AS A HYDROPHILING AGENT

Friedrich Engelhardt; Karl Hintermeier, both of Frankfurt; Otto Smerz, Kelkheim, and Hans Wagener, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

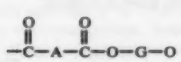
Filed Nov. 8, 1983, Ser. No. 549,763

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3244011

Int. Cl.³ C08G 63/16

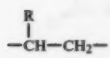
U.S. Cl. 528—301 14 Claims

1. A water-dispersible polyester having structural units of the formula



wherein

A is, on statistical average, 80 to 100 mol percent of p-phenylene and 0 to 20 mol percent of divalent moieties of the formula

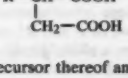


and wherein

G is, on statistical average, 30 to 90 mol percent of linear or branched divalent alkane moieties having 3 to 6 carbon atoms which may be interrupted by 1 or 2 oxygen atoms, 10 to 30 mol percent of divalent polyether moieties having an average molecular weight of 1,000 to 3,000, and up to 50 mol percent of ethylene moieties, and

R is a straight-chain or branched alkyl or alkenyl having 6 to 18 carbon atoms.

7. A process for preparing the water-dispersible polyester of claim 1 which comprises reacting an acid mixture with a polyol mixture at temperatures of 100° to 280° C. wherein said acid mixture comprises 80–100 mol percent of terephthalic acid or precursor thereof and up to 20 mol percent of an alkylsuccinic acid of the formula



or precursor thereof and said polyol mixture comprises

30 to 90 mol percent of a linear or branched alkanediol having 3 to 6 carbon atoms,

10 to 30 mol percent of a polyethylene glycol having a mean molecular weight of 1,000 to 3,000 and

up to 50 mol percent of ethylene glycol.

4,463,166

PROCESS FOR MAKING POLYTETRAMETHYLENE ADIPAMIDE

Edmond H. J. P. Bour, Limbricht, and Jean M. M. Warnier, Urmond, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

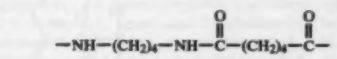
Filed Oct. 13, 1982, Ser. No. 433,879

Claims priority, application Netherlands, Oct. 13, 1981, 8104639

Int. Cl.³ C08G 69/28

U.S. Cl. 528—336 10 Claims

1. Process for preparing a nylon 4,6 polymer consisting substantially of repeating units of:



which process consists essentially in:

(a) heating adipic acid or the salt thereof, 1,4-diaminobutane or the salt thereof and from 0 weight % to 25 weight % of one or more nylon-forming compounds, in a 2-pyrrolidone solvent at a temperature between about 150° C. and about 300° C., at a pressure sufficient to maintain said solvent in a liquid state, to form a reaction solution and to obtain said nylon 4,6 polymer product therein; and

(b) subsequently recovering said polymer product from said reaction solution.

4,463,167

TWO STAGE HIGH MOLECULAR WEIGHT POLYBENZIMIDAZOLE PRODUCTION WITH PHOSPHORUS CONTAINING CATALYST

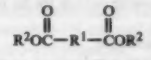
Eui W. Choe, Randolph; Anthony B. Conciatori, Chatham, both of N.J., and Bennett C. Ward, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,093

Int. Cl.³ C08G 73/18

U.S. Cl. 528—336 16 Claims

1. A two stage polymerization process for the production of high molecular weight polybenzimidazole from a mixture of (1) at least one aromatic tetraamine containing two groups of amine substituents, said amine substituents in each group being in an ortho position relative to each other, and (2) at least one dicarboxylate ester corresponding to the formula:



where R^1 is a substituent selected from aromatic, alkylene or heterocyclic groups, and R^2 is a substituent selected from aliphatic, alicyclic or aromatic groups, which comprises heating the mixture above its melting temperature in a first stage melt polymerization zone in contact with a phosphorus-containing polymerization catalyst selected from arylphosphines or arylphosphites, to provide a foamed prepolymer; and heating the prepolymer in a second stage solid state polymerization zone at a temperature above about 250° C. to produce high molecular weight polybenzimidazole product.

4,463,168

POLYCAPROLACTONE POLYMERS

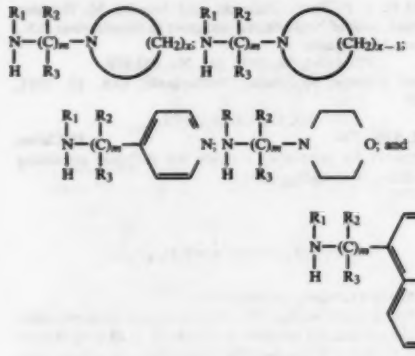
Robert D. Lundberg, Bridgewater, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 332,813, Dec. 21, 1981, Pat. No. 4,379,914. This application Dec. 23, 1983, Ser. No. 565,104

Int. Cl.³ C08G 63/08

U.S. Cl. 528—355 9 Claims

1. A polycaprolactone formed by the reaction of an ε-caprolactone with an amine compound having the formula selected from the group consisting of:



wherein R_1, R_2, and R_3 are selected from the group consisting of the hydrogen, alkyl groups having about 1 to about 10 carbon atoms and aryl groups having about 1 to about 10 carbon atoms, x is an integer of from 4 to 7 and m is an integer of from 0 to 20.

4,463,169

THREE COMPONENT, CARBOXYL-CONTAINING COMPOSITIONS COMPRISING DIMERCAPTAN

Edward Irving, Burwell, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,235

Claims priority, application United Kingdom, Sep. 19, 1981, 8128383; Jun. 4, 1982, 8216346

Int. Cl.³ C08G 83/00

U.S. Cl. 528—376 10 Claims

1. A polymerizable film-forming composition comprising

(a) a compound containing in the molecule

(i) at least one group selected from acryloyloxy or methacryloyloxy groups,

(ii) at least one group selected from allyl, methallyl, or 1-propenyl groups, each of which is attached, directly or through an oxygen atom or through an oxycarbonyl group (—OCO—), to a carbon atom which forms part of an aromatic nucleus,

(b) a compound containing in the molecule

(iii) at least one group selected from acryloyloxy or methacryloyloxy groups and

(iv) at least one free carboxyl group, and

(c) a compound containing, per molecule, at least two mercaptan groups directly attached to an aliphatic carbon atom or atoms, in a proportion as to supply at least 0.8 such mercaptan group per group selected from allyl, methallyl, or 1-propenyl groups in (a) but less than 1.0 such mercaptan group per group selected from acryloyl, methacryloyl, allyl, methallyl, or 1-propenyl groups in (a) with (b).

4,463,170

POLYMERIC COMPOUNDS PREPARED FROM DIPHENYLAMINE AND DIHYDROXYALKYLBENZENE

Richard E. Gloth, Copley; James J. Tazuma, Stow, and Robert A. Smith, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 26, 1983, Ser. No. 460,979

Int. Cl.³ C08G 73/00

U.S. Cl. 528—422 13 Claims

1. A polymeric reaction product of diphenylamine and di-alpha-hydroxyalkylbenzene wherein the hydroxyalkyl groups are positioned meta or para to each other and the alkyl group contains from 1 to 8 carbon atoms.

4,463,171

DERIVATIVES OF MACROLIDE ANTIBIOTICS

Hamao Umezawa; Tomio Takeuchi; Kuniaki Tatsuta, all of Tokyo; Tomoyuki Ishikura, Chigasaki; Rokuro Okamoto, Fujisawa; Masao Yamamoto, Fujisawa, and Kohki Kiyoshima, Fujisawa, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

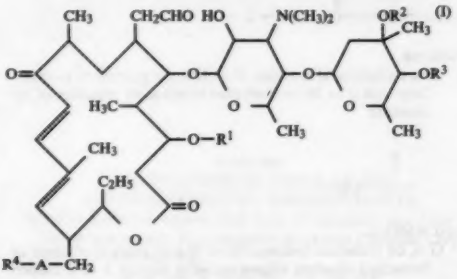
Filed Jun. 9, 1983, Ser. No. 502,480

Claims priority, application Japan, Jun. 15, 1982, 57-101462

Int. Cl.³ C07H 17/08

U.S. Cl. 536—7.1 7 Claims

1. A compound of the following general formula:



wherein

R^1 and R^2 represent a hydrogen atom or a lower alkanoyl group having 2 to 6 carbon atoms;

R^3 represents a hydrogen atom or the group $—COCH_2R^5$ in which R^5 represents a lower alkyl group having 1 to 4 carbon atoms or an aryl or pyridyl group bonded through a sulfur atom;

R^4 represents a lower alkyl group having 1 to 4 carbon atoms, an aryl methyl group, pyridyl methyl group, a hydronyl lower alkyl group having 1 to 4 carbon atoms, an aryl group, a nitrile group, a 5- or 6-membered heterocyclic group having 1 to 4 hetero atoms selected from nitrogen and sulfur atoms, a tetrahydropyranyl group or a 6-methoxytetrahydropyran-2-yl group;

A represents the group —O— or —S—, or A and R^4, taken together, represent a halogen atom or a nitrile group, or a pharmaceutical acceptable salt thereof.

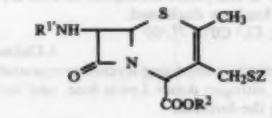
4,463,172

PROCESS FOR PRODUCING 2-METHYL CEPHEM-2-EM AND 2-METHYLCEPHEM-3-EM DERIVITAVES

Satoshi Horii, Sakai; Nariakira Mizokami, Toyonaka, and Yutaka Kuwada, Ashiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 19, 1981, Ser. No. 235,998
Claims priority, application Japan, Feb. 25, 1980, 55-22951
Int. Cl.³ C07D 501/04; A61K 31/545
U.S. Cl. 544—027 15 Claims

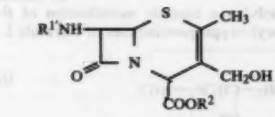
1. A process for producing a ceph-2-em derivative of the formula:



(Ib')

wherein $R^{1'}$ is an acyl group represented by the following formula:

wherein A is phenyl, thienyl or 2-aminothiazol group; L is hydrogen, amino or N-lower-alkyl-2,3-dioxo-1-piperazinylcarboxamide group; M is hydrogen; and L and M combine to be =N—OB group (B is a lower alkyl group); —$COOR^2$ is a carboxyl group or esterified carboxyl group; and Z is a heterocyclic group selected from the group consisting of thiadiazolyl, tetrazolyl, triazolyl, oxadiazolyl, oxazolyl, thiazolyl, thiazolinyl, pyridyl, pyridazinyl and tetrazolopyridazinyl, or said heterocyclic group substituted by substituents selected from the group consisting of lower alkyl groups, lower alkyl groups substituted by hydroxy, carboxy, dimethylamino or sulfo, mercapto groups, hydroxy group, amino group, lower alkylthio groups and lower alkoxy groups; or a pharmaceutically acceptable salt thereof, which comprises reacting a ceph-2-em derivative of the formula:



(IId')

wherein $R^{1'}$ and —$COOR^2$ have the same meaning as above, or a pharmaceutically acceptable salt thereof, with a halogenating agent, and then with a heterocyclic thiol compound or a substituted heterocyclic thiol compound of the formula: ZSH, wherein Z has the same meaning as defined above or a pharmaceutically acceptable salt thereof to produce the ceph-2-em derivative of formula (Ib').

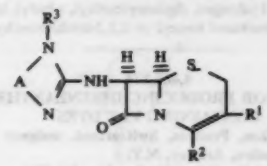
4,463,173

CEPHALOSPORIN DERIVATIVES

Frederic H. Jung, Reims, France, assignor to ICI Pharma, Enghien-les-Bains, France

Filed Dec. 24, 1980, Ser. No. 219,879
Claims priority, application France, Dec. 24, 1979, 79 31616
Int. Cl.³ C07D 501/116
U.S. Cl. 544—27 4 Claims

1. A cephalosporin derivative of the formula:



I

in which R^1 is a hydrogen or chlorine atom, or a methoxy, acetoxymethyl, carbamoyloxymethyl, pyridiniummethyl, (4-carbamoyl)pyridiniummethyl, 1-methyl-1H-tetrazol-5-ylthiomethyl, 1-carboxymethyl-1H-tetrazol-5-ylthiomethyl, 1-(2-dimethylamino)ethyl-1H-tetrazol-5-ylthiomethyl, 1-sulphomethyl-1H-tetrazol-5-ylthiomethyl, 1-isopropyl-1H-tetrazol-5-ylthiomethyl, 1-(2,2,2-trifluoro)ethyl-1H-tetrazol-5-ylthiomethyl, 1-phenyl-1H-tetrazol-5-ylthiomethyl, 1-(2-methylthio)ethyl-1H-tetrazol-5-ylthiomethyl, 1,3,4-thiadiazol-2-ylthiomethyl, 5-methyl-1,3,4-thiadiazol-2-ylthiomethyl, 4-methyl-5-carboxymethylthiazol-2-ylthiomethyl, 1H-1,2,3-triazol-4-ylthiomethyl, 5-trifluoromethyl-1H-1,2,4-triazol-3-ylthiomethyl, 4,6-dimethylpyrimid-2-ylthiomethyl, 2-thiazolin-2-ylthiomethyl, benzoxazol-2-ylthiomethyl, benzthiazol-2-ylthiomethyl, 2-carboxyphenylthiomethyl, (6-hydroxy-2-methyl-5-oxo-2H-1,2,4-triazin-3-yl)thiomethyl, (6-hydroxy-4-methyl-5-oxo-2H-1,2,4-triazin-3-yl)thiomethyl, (6-carboxymethyl-7-hydroxypyrrolo[1,2,b]pyridazin-2-yl)thiomethyl or 1,2,3-thiadiazol-5-ylthiomethyl radical;

R^2 is a carboxyl radical;

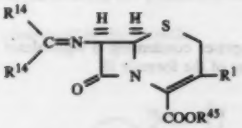
R^3 is a hydrogen atom; and

A is of the formula II;

II

in which R^4 is a hydrogen atom, an alkyl radical of 1 to 6 carbon atoms, a hydroxyalkyl radical of 1 to 6 carbon atoms or an aminoalkyl radical of 1 to 6 carbon atoms and R^5 is a hydrogen atom or R^4 and R^5 are both alkyl radicals of 1 to 6 carbon atoms.

4. A cephalosporin derivative of the formula



XXXVII

in which R^1 is a hydrogen or chlorine atom, or a methoxy, acetoxymethyl, carbamoyloxymethyl, pyridiniummethyl, (4-carbamoyl)pyridiniummethyl, 1-methyl-1H-tetrazol-5-ylthiomethyl, 1-carboxymethyl-1H-tetrazol-5-ylthiomethyl, 1-(2-dimethylamino)ethyl-1H-tetrazol-5-ylthiomethyl, 1-sulphomethyl-1H-tetrazol-5-ylthiomethyl, 1-isopropyl-1H-tetrazol-5-ylthiomethyl, 1-(2,2,2-trifluoro)ethyl-1H-tetrazol-5-ylthiomethyl, 1-phenyl-1H-tetrazol-5-ylthiomethyl, 1-(2-methylthio)ethyl-1H-tetrazol-5-ylthiomethyl, 1,3,4-thiadiazol-2-ylthiomethyl, 5-methyl-1,3,4-thiadiazol-2-ylthiomethyl, 4-methyl-5-carboxymethylthiazol-2-ylthiomethyl, 1H-1,2,3-triazol-4-ylthiomethyl, 5-trifluoromethyl-1H-1,2,4-triazol-3-ylthiomethyl, 4,6-dimethylpyrimid-2-ylthiomethyl, 2-thiazolin-2-ylthiomethyl, benzoxazol-2-ylthiomethyl, benzthiazol-2-ylthiomethyl, 2-carboxyphenylthiomethyl, (6-hydroxy-2-methyl-5-oxo-2H-1,2,4-triazin-3-yl)thiomethyl, (6-hydroxy-4-methyl-5-oxo-2H-1,2,4-triazin-3-yl)thiomethyl, (6-carboxymethyl-7-hydroxypyrrolo[1,2,b]pyridazin-2-yl]thiomethyl or

1,2,3-thiadiazol-5-ylthiomethyl radical, R^{14} is chlorine or bromine and R^{45} is hydrogen, diphenylmethyl, t-butyl, trimethylsilyl, benzyl, substituted benzyl or 2,2,2-trichloroethyl.

4,463,174

PROCESS FOR PRODUCING DIBENZANTHRONE CONTAINING VAT DYES

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

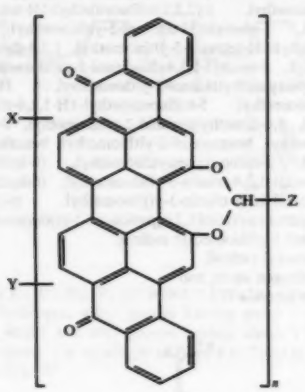
Filed Sep. 22, 1982, Ser. No. 421,578

Claims priority, application Switzerland, Sep. 28, 1981, 6233/81

Int. Cl.³ C07D *413/12, 413/14, 321/10*

U.S. Cl. 544—131 **10 Claims**

1. A process for producing a vat dye of the formula I



(I)

wherein

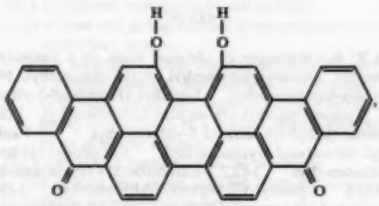
n is 1 or 2,

Z is H, unsubstituted or substituted alkyl, unsubstituted or substituted aryl or a heterocyclic radical, when n is 1, or a direct bond, unsubstituted or substituted alkylene, unsubstituted or substituted arylene or a heterocyclic radical, when n is 2,

X is H, Cl or a group of the formula $—SO_2T$, where T is the radical of an aliphatic or aromatic, primary or secondary amine, and

Y is H or Cl,

which process comprises condensing n equivalents of dihydroxydibenzanthrone of the formula II



(II)

in chlorosulfonic acid, with an aldehyde of the formula III

$$Z—(CHO)_n \qquad \text{(III)}$$

wherein Z and n have the meanings defined above, and subsequently, if dyes of the formula I in which X and/or Y are (is) not hydrogen are being produced, chlorinating the reaction product and/or reacting it with thionyl chloride and an amine of the formula IV

$$H—T \qquad \text{(IV)},$$

where T has the meaning defined above.

4,463,175

MOLYBDENUM TRIOXIDE LAYERED COMPOUNDS

Jack W. Johnson, Fanwood, and Allan J. Jacobson, Princeton, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

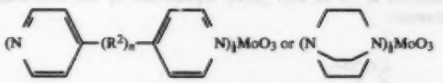
Continuation-in-part of Ser. No. 205,142, Nov. 10, 1980, Pat. No. 4,355,161. This application Jul. 29, 1982, Ser. No. 403,057

The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.

Int. Cl.³ C07F *11/00*

U.S. Cl. 544—225 **4 Claims**

1. A composition of matter comprising layered compounds containing MoO_3 and a nitrogen donor Lewis base, said layered compounds having the formulae



where n is 0 or 1 and R^2 is methylene, alkylene, alkenylene or alkynylene of 2 to 6 carbon atoms, C_6–C_{10} arylene, C_7–C_{14} aralkylene, oxygen or sulfur, the layered compounds being characterized in that the nitrogen donor Lewis base is covalently bound to molybdenum atoms in separate molybdenum oxide layers and the Lewis base has the steric requirement such that the maximum cross-sectional area of said base perpendicular to an axis running through the Lewis base-Mo bond is less than about 30 $(Å)^2$.

4,463,176

PROCESS FOR RESOLUTION OF OPTICAL ISOMERS

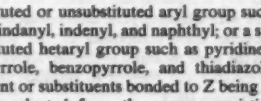
Ronald D. Dennis; Terence M. Dolak, and William E. Kreighbaum, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Sep. 13, 1982, Ser. No. 417,794

Int. Cl.³ C07D *401/12*

U.S. Cl. 546—208 **10 Claims**

1. A process for resolving a racemic modification of β-adrenergic aryl- or hetaryl-oxypropanolamines of Formula I



(I)

wherein

Z is substituted or unsubstituted aryl group such as phenyl, tetralyl, indanyl, indenyl, and naphthyl; or a substituted or unsubstituted hetaryl group such as pyridine, benzopyridine, pyrrole, benzopyrrole, and thiadiazole; with the substituent or substituents bonded to Z being a member or members selected from the group consisting of lower (C_1–C_6) alkyl, lower alkoxy, lower alkenyl, lower alkenyloxy, lower alkynyl, lower alkynyloxy, lower alkylthio, lower alkanoyl, hydroxy-lower alkyl, cyano, lower cycloalkyl, lower cycloalkenyl, carbamoyl, lower alkylcarbamoyl, carbamoyl-lower alkyl, lower alkyl carbamoyl-lower alkoxy, lower alkoxy-lower alkyl, N-morpholino, hydroxy, and halogen;

Y is C_1 to C_{10} alkyl or AB

wherein

A is an alkyl chain from 1 to 10 carbons, branched and unbranched, and

B is selected from the group consisting of Z, as defined hereinabove, furan, benzofuran, thiophene, benzothiophene, pyrrolidine, and piperidine;

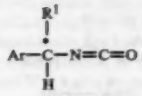
X is hydrogen or

wherein

R is C_1–C_{10} alkyl, phenyl, or alkylphenyl;

which comprises

(1) treating an appropriate β-adrenergic aryl- or hetaryloxypropanolamine of Formula I, as defined hereinabove, with a chiral isocyanate of Formula II

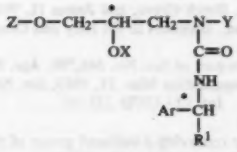


(II)

wherein

Ar is phenyl or naphthyl either unsubstituted or substituted with a member or members of the group defined as substituents bonded to Z; and

R^1 is C_1–C_6 alkyl; thereby yielding a pair of diastereomeric urea derivatives of Formula III



(III)

wherein R^1, Ar, X, Y, and Z are as defined hereinabove;

(2) separating the diastereomeric pair of ureas into the individual diastereomers; and

(3) generating the propanolamine enantiomer by treating the respective urea diastereomer with an excess of hydrazine hydrate followed by a similar excess of an α-keto carboxylic acid.

4,463,177

PROCESS FOR MAKING M-HYDROXYPHENYL SUBSTITUTED COMPOUNDS

Robin G. Shepherd, Maidenhead, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

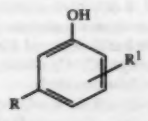
Filed Nov. 26, 1982, Ser. No. 444,653

Claims priority, application United Kingdom, Dec. 2, 1981, 8136364; Jul. 16, 1982, 8220721

Int. Cl.³ C07D *211/74*

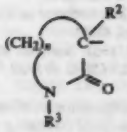
U.S. Cl. 546—221 **15 Claims**

1. A process for preparing a m-hydroxyphenyl substituted compound of the formula:



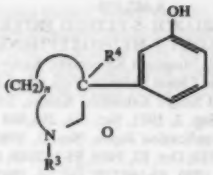
(I)

where R is —CH_2COOH; —CH_2COOC_{1-4} alkyl; a heterocyclic group of the formula:



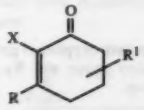
(III)

where n is 2, 3 or 4; R^2 is hydrogen or C_{1-6} alkyl; and R^3 is hydrogen, C_{1-6} alkyl, C_{1-6} alkenyl, C_{1-6} alkynyl, cycloalkyl(lower)alkyl in which the cycloalkyl group contains 3–6 carbon atoms and the (lower)alkyl group contains 1–4 carbon atoms, or phenyl(lower)alkyl in which the phenyl group may be substituted by a halogen, C_{1-4} alkoxy, C_{1-4} alkyl or trifluoromethyl group and the (lower)alkyl group contains 1–4 carbon atoms



(IV)

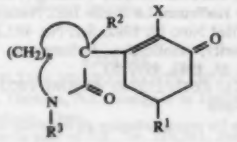
and R^1 is hydrogen, C_{1-6} alkyl, phenyl or chlorophenyl (the R^1 substituent being meta to both the R group and the hydroxy group), which process comprises dehydrohalogenating a compound of the formula:



(II)

where R and R^1 have the meanings given above and X is chlorine or bromine, in the presence of a strong nucleophilic catalyst.

11. A compound of the formula:



wherein

n is 2, 3 or 4,

X is chlorine or bromine,

R^1 is hydrogen, C_{1-6} alkyl, phenyl or chlorophenyl,

R^2 is hydrogen or C_{1-6} alkyl,

R^3 is hydrogen, C_{1-6} alkyl, C_{1-6} alkenyl, C_{1-6} alkynyl, cycloalkyl(lower)alkyl in which the cycloalkyl group contains from 3–6 carbon atoms and the (lower)alkyl group contains 1–4 carbon atoms, or phenyl(lower)alkyl in which the phenyl group may be substituted by a halogen, C_{1-4} alkoxy, C_{1-4} alkyl, or trifluoromethyl group and (lower)alkyl contains 1–4 carbon atoms.

4,463,178

METHOD OF PREPARING DIBENZOTHIAZOLYL DISULFIDES

James J. Tazuma, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 27, 1982, Ser. No. 453,323
Int. Cl.³ C07D 417/12
U.S. Cl. 548—158 **9 Claims**

1. In a process for the preparation of dibenzothiazolyl disulfide which comprises the steps of oxidizing mercaptobenzothiazole in an aqueous media with a hydroperoxide selected from the group consisting of hydrogen peroxide and alkyl hydroperoxides of 3 to 6 carbon atoms, wherein the mol ratio of hydroperoxide to mercaptobenzothiazole is from 0.5 to 0.55, the improvement characterized in that; the aqueous media has dissolved therein ammonia or an amine selected from the group consisting of methyl amine, dimethyl amine, trimethyl amine and diethanol amine wherein the concentration of the ammonia or amine can range from 10 to 100 mol percent based on mols of mercaptobenzothiazole.

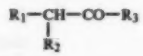
4,463,179

1H-1,2,3-TRIAZOL-5-YLTHIO ESTER OF N-CARBOBENZYLOXY-P-HYDROXYPHENYLGLYCINE

Masahiro Murakami; Masateru Kobayashi; Kimiyo Yamamoto, all of Nobeoka, and Chisei Shibuya, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1981, Ser. No. 298,884
Claims priority, application Japan, Sep. 2, 1980, 55-120619; Sep. 4, 1980, 55-121718; Oct. 13, 1980, 55-142048; Oct. 22, 1980, 55-146859; Oct. 24, 1980, 55-148178; Jul. 14, 1981, 56-108797
Int. Cl.³ C07D 249/18
U.S. Cl. 548—255 **1 Claim**

1. A thioester compound represented by the following general formula (I):



wherein R_1 stands for a p-hydroxyphenyl group, R_2 stands for an N-carbobenzyloxyamino group and R_3 stands for a 1H-1,2,3-triazol-5-ylthio group.

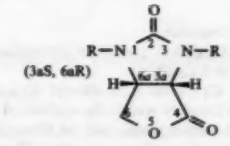
4,463,180

PROCESS AND INTERMEDIATES FOR THE MANUFACTURE OF (3aS, 6aR)-1,3-DIBENZYLDIHYDRO-1H-FURO[3,4-d] IMIDAZOLE-2,4(3H,3AH)-DIONE

Horst Pauling, Bottmingen; Christof Wehrli, Birsfelden, both of Switzerland, and Jean-Jacques Vorsanger, Hannut, Belgium, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

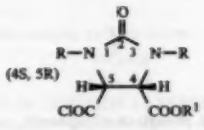
Filed Nov. 12, 1982, Ser. No. 441,312
Claims priority, application Switzerland, Dec. 7, 1981, 7803/81; Aug. 18, 1982, 4940/82
Int. Cl.³ C07D 233/40, 491/048; C07J 00/00
U.S. Cl. 548—303 **23 Claims**

1. A process for manufacturing an optically active lactone of the formula



I

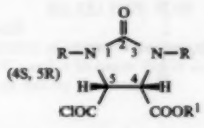
wherein R is benzyl,
comprising reducing an optically active compound of the formula



II

wherein R is as above and R^1 is cholesteryl or cyclohexyl, with a dialkylaluminium hydride or a complex borohydride to produce lactone I.

21. An optically active compound of the formula



II

wherein R^1 is cholesteryl or cyclohexyl and R is benzyl.

4,463,181

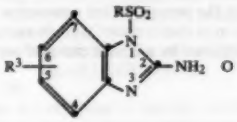
PROCESS FOR REMOVING SULFONYL GROUPS FROM BENZIMIDAZOLE ISOMERS

Tina M. Morwick, Beech Grove, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 366,759, Apr. 8, 1982, abandoned. This application Mar. 21, 1983, Ser. No. 477,476
Int. Cl.³ C07D 235/30
U.S. Cl. 548—306 **9 Claims**

1. A process for removing a sulfonyl group of the formula RSO_2 from the 1-position of a benzimidazole compound which consists essentially of

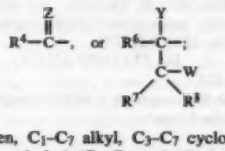
reacting a benzimidazole compound of the formula O



with an alkali metal hydroxide or carbonate in an inert aqueous organic solvent system selected from acetone, dimethoxy ethane, tetrahydro furan and tertiary amides at a temperature from about 20° C. to about 100° C., wherein

R is C_1–C_5 alkyl, C_3–C_7 cycloalkyl, phenyl, furyl, or thienyl;

R^3 is C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, nitro, C_1–C_4 alkylthio, phenylthio, phenoxy, carboxy, methylsulfonyl, trifluoromethyl,

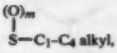


R^4 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)ethyl, thienyl, benzyl, phenyl, or mono-substituted phenyl wherein said phenyl substituent is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro, and trifuluromethyl;

R^6 is hydrogen, C_1–C_7 alkyl, C_3–C_7 cycloalkyl, (C_3–C_7 cycloalkyl)methyl, 1-(C_3–C_7 cycloalkyl)-ethyl, phenyl, or mono-substituted phenyl, wherein said phenyl substituent is selected from the group consisting of C_1–C_4 alkyl,

C_1–C_4 alkoxy, chloro, bromo, iodo, nitro, and trifluoromethyl;

R^7 and R^8 independently are hydrogen, halo, cyano, hydroxymethyl, nitro,



CH_2R^9, COR^9, phenyl or mono-substituted phenyl, wherein said phenyl substituent is selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 alkoxy, chloro, bromo, iodo, nitro, and trifluoromethyl;

R^9 is hydroxy, C_1–C_4 alkoxy, halo, C_3–C_6 cycloalkyl C_1–C_4 alkoxy, or $(O—C_1–C_4 \text{ alkyl})_p NR^{10}R^{11}$ wherein

R^{10} and R^{11} independently are hydrogen or C_1–C_4 alkyl;

Z is oxygen, C_1–C_7 alkylidene, or C_1–C_4 alkoxyimino;

Y is hydrogen, and W is hydroxy, or together Y and W form a bond;

m is 0, 1, or 2; and

p is 0 or 1.

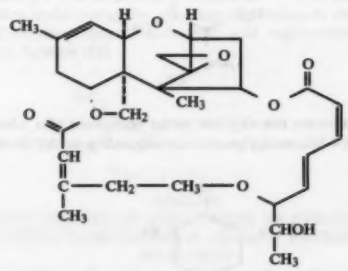
4,463,182

ANTIBIOTIC RORIDIN E-2

William G. Freckman, Mt. Clemens; Zbigniew L. Jakubowski, St. Clair Shores; Richard H. Bunge, Mt. Clemens; James C. French, Ann Arbor, and Lucia E. Balta, Harper Woods, all of Mich., assignors to Warner-Lambert Company, Ann Arbor, Mich.

Filed Jun. 26, 1978, Ser. No. 919,023
Int. Cl.³ C07D *493/20*
U.S. Cl. 549—264 **1 Claim**

1. Antibiotic roridin E-2 in substantially purified form represented by the formula



I

characterized by

(a) a proton resonance spectrum in $CDCl_3$ having principal signals at (s=singlet, d=doublet, t=triplet, m=multiplet): 0.80s, 1.18d (J=6), 1.72s, 2.25d (J=1), 2.84d (J=4), 3.16d (J=4), 4.09d (J=12), 4.13d (J=12), 4.11d (J=12), 5.50m,5.84m (complex; area=3), 6.37dd (J=4, 8), 6.62t (J=11), 7.59dd (J=11, 15) parts per million downfield from tetramethylsilane.

(b) melting point 184°–188° C. (uncorrected) and

(c) optical rotation $[\alpha]_D$—74° (0.85% in chloroform).

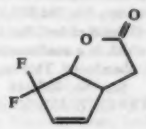
4,463,183

METHOD FOR PREPARING A PROSTACYCLIN INTERMEDIATE

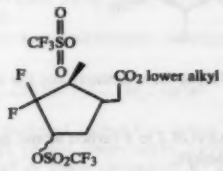
Martin F. Haslanger, Lambertville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 368,607, Apr. 15, 1982, which is a division of Ser. No. 308,737, Oct. 5, 1981, Pat. No. 4,341,710, which is a division of Ser. No. 216,598, Dec. 15, 1980, Pat. No. 4,317,906. This application Apr. 25, 1983, Ser. No. 488,488
Int. Cl.³ C07D *307/83*
U.S. Cl. 549—311 **1 Claim**

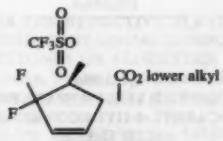
1. A method for preparing an unsaturated difluoro lactone compound of the structure



and stereoisomers thereof, which includes the steps of reacting 3,3-difluoro-2,4-dihydroxy-cyclopentaneacetic acid with alkanolic hydrochloric acid to form the corresponding alkyl ester, reacting the alkyl ester with trifluoromethanesulfonic anhydride to form the triflate of the structure



reacting the triflate with diazabicyclo[5,4,0]undec-5-ene to form the olefin ester



treating the olefin ester with an alkali metal hydroxide, acidifying same, and then reacting same with trifluoroacetic anhydride to form the difluoro lactone.

4,463,184

PROCESS FOR THE PREPARATION OF CARBOFURAN

David A. Hunt, Durham, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 289,361, Jul. 31, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,199
Int. Cl.³ C07D *307/86, 49/603*
U.S. Cl. 549—470 **19 Claims**

1. A process for the preparation of 2,3-dihydro-2,2-dimethyl-7-benzofuranyl-N-methyl carbamate which comprises the steps of:

(a) reacting 1,2-cyclohexanedione with a beta-methallyl alcohol or halide in the presence of alkylation catalyst to form 2-beta-methallyloxy-2-cyclohexen-1-one;

(b) heating said 2-beta-methallyloxy-2-cyclohexen-1-one to a temperature sufficient to cause rearrangement and aromatization to 2,3-dihydro-2,2-dimethyl-7-benzofuranol; and

(c) reacting said 2,3-dihydro-2,2-dimethyl-7-benzofuranol

with methyl isocyanate to form said 2,3-dihydro-2,2-dimethyl-7-benzofuranyl-N-methyl carbamate.

19. 2-beta-methallyloxy-2-cyclohexen-1-one.

4,463,185

1-(6-HYDROXY-4- OR 7-METHOXY-5-BENZOFURANYL)-4-SUBSTITUTED-1,3-BUTANEDIONES

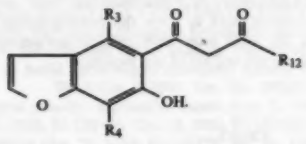
Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 201,932, Oct. 29, 1980, Pat. No. 4,367,341, which is a division of Ser. No. 116,322, Jan. 28, 1980, Pat. No. 4,284,569, which is a continuation-in-part of Ser. No. 11,816, Feb. 13, 1979, abandoned. This application Jul. 30, 1982, Ser. No. 403,948

Int. Cl.³ C07D *307/86, 307/78*

U.S. Cl. 549—471 **2 Claims**

1. A compound of the formula



XXIII

wherein one of R_3 or R_4 is methoxy and the other is methoxy or hydrogen;

wherein R_{12} is:

(a) alkylthioalkyl of 2 to 8 carbon atoms, inclusive;

(b) trifluoromethyl;

(c) cycloalkyl of 3 to 10 carbon atoms, inclusive; or

(d) $—CH_2—SO—R_{10}$ or $—CH_2—SO_2—R_{10}$, wherein R_{10} is alkyl of one to 5 carbon atoms, inclusive.

4,463,186

PROCESS FOR THE PREPARATION OF 3,5-DIHYDROCARBYL-4-HYDROXYBENZYLMALONIC ACID ESTERS

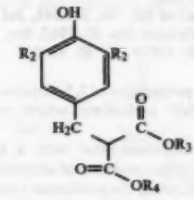
Charles R. Everly, and Jerry M. Roper, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 15, 1982, Ser. No. 418,577

Int. Cl.³ C09C *67/03*

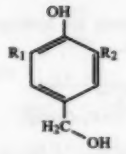
U.S. Cl. 560—82 **17 Claims**

1. A process for the preparation of 3,5-dihydrocarbyl-4-hydroxybenzylmalonic acid esters corresponding to the formula:



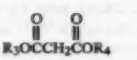
(III)

which comprises reacting one molar equivalent of a 2,6-dihydrocarbyl-4-hydroxymethylphenol corresponding to the formula:



(I)

with at least one molar equivalent of an ester of a 1,3-dicarboxylic acid corresponding to the formula:



(II)

in the presence of at least one molar equivalent of an alkali metal hydride or an alkaline earth metal hydride wherein R_1 and R_2 are the same or different and are hydrogen or hydrocarbyl radicals with the provision that at least one of R_1 or R_2 must be other than hydrogen. R_3 and R_4 are the same or different and are hydrogen, or alkyl radicals having 1 to 20 carbon atoms with the provision that at least one of R_3 or R_4 must be other than hydrogen.

4,463,187

PROCESS FOR THE PREPARATION OF 3,5-DIHYDROCARBYL-4-HYDROXYBENZYLMALONIC ACID ESTERS

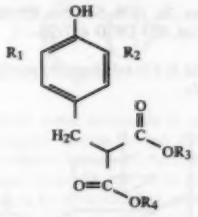
Charles R. Everly, and Jerry M. Roper, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 15, 1982, Ser. No. 418,576

Int. Cl.³ C07C *67/03*

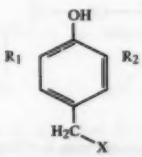
U.S. Cl. 560—82 **17 Claims**

1. A process for the preparation of 3,5-di-hydrocarbyl-4-hydroxybenzylmalonic acid esters corresponding to the formula:



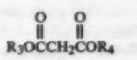
(III)

which comprises reacting one molar equivalent of a 2,6-dihydrocarbyl-4-halomethylphenol corresponding to the formula:



(I)

with at least one molar equivalent of an ester of a 1,3-dicarboxylic acid corresponding to the formula:



(II)

in the presence of at least one molar equivalent of an alkali metal hydride or an alkaline earth metal hydride wherein R_1 and R_2 are the same or different and are hydrogen or hydrocarbyl radicals having up to at least 40 carbon atoms with the provision that at least one of R_1 or R_2 must be other than hydrogen, R_3 and R_4 are the same or different and are hydrogen, linear or branched alkyl radicals having up to at least 20 carbon atoms with the provision that at least one of R_3 or R_4 must be other than hydrogen and X is chlorine, bromine or iodine.

4,463,188

METHOD FOR RACEMIZATION OF OPTICALLY ACTIVE 2,2-DIMETHYLCYCLOPROPANE-1-CARBOXYLIC ACID

Gohfu Suzukamo, Osaka; Masami Fukao, and Yukio Yoneyoshi, both of Shiga, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osoda, Japan

Filed Apr. 4, 1983, Ser. No. 481,946

Claims priority, application Japan, Apr. 6, 1982, 57-57488

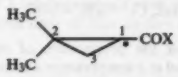
Int. Cl.³ C07C *51/58, 51/04*

U.S. Cl. 562—506 **5 Claims**

1. A method for racemization of an optically active 2,2-dimethylcyclopropane-1-carboxylic acid halide which comprises heating an optically active 2,2-dimethylcyclopropane-1-carboxylic acid halide represented by the general formula;

wherein X is a halogen atom to a temperature of about 80° C. to about 300° C.

2. A method for racemization of optically active 2,2-dimethylcyclopropane-1-carboxylic acid which comprises converting optically active 2,2-dimethylcyclopropane-1-carboxylic acid to a corresponding halide thereof represented by the general formula (I);



(I)

wherein X is a halogen atom, racemizing the said acid halide by heating it to a temperature of about 80° C. to about 300° C. and then hydrolyzing the resulting acid halide to obtain 2,2-dimethylcyclopropane-1-carboxylic acid represented by the general formula (II);

(II)

4,463,189

STABILIZATION OF POLYETHER OR POLYESTER MOLDING COMPOSITIONS AGAINST PREMATURE REACTION

Bernd Hoffmann, Frankfurt am Main, and Klaus-Jürgen Behme, Eppstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,938

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139401

Int. Cl.³ C07C *85/26*

U.S. Cl. 564—2 **7 Claims**

1. A process for stabilizing mixtures containing an amine having a primary or secondary aliphatic hydroxyl group, and also a customary quantity of trichlorotrifluoroethane and/or trichlorofluoromethane as a blowing agent, against premature reaction of components, by incorporating into the mixture from 0.05 to 5% by weight of 2,4-diphenyl-4-methylpentene in which the ratio of the 2,4-diphenyl-4-methyl-1-pentene isomer to the 2,4-diphenyl-4-methyl-2-pentene isomer is 1:1 to 9:1, the percentages relating to the chlorofluoroalkane.

2. A process for stabilizing mixtures containing an amine having a primary or secondary aliphatic hydroxyl group, and also a customary quantity of trichlorotrifluoroethane and/or trichlorofluoromethane as a blowing agent, against premature reaction of components, by incorporating into the mixture from 0.1 to 5% by weight of a mixture of stabilizers composed of 45 to 89% by weight of 2,4-diphenyl-4-methyl-1-pentene, 10 to 45% by weight of 2,4-diphenyl-4-methyl-2-pentene and 1 to 20% by weight of 1,1,3-trimethyl-3-phenylindane, the percentages relating to the chlorofluoroalkane.

4,463,190

1-ARYLOXY-4-AMINO-2-BUTANOLS

Carl D. Lunsford, and Ying-Ho Chen, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Continuation of Ser. No. 813,056, Jul. 5, 1977, Pat. No. 4,379,167, which is a continuation-in-part of Ser. No. 730,498, Oct. 17, 1976, abandoned, which is a continuation of Ser. No. 618,984, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,122, Oct. 25, 1974, abandoned. This application Sep. 16, 1982, Ser. No. 418,942

Int. Cl.³ C07C *93/06, 83/00, 93/00, 95/00*

U.S. Cl. 564—349 **1 Claim**

1. A 1-aryloxy-4-amino-2-butanol compound having the formula:

$$ArO—CH_2—CHOH—CH_2—CH_2—NR^1R^2$$

wherein Ar is 2-naphthyl, indene-4-yl, indene-5-yl or pheny; R^1 is lower alkyl, phenyl, phenyl-alkyl, 2-hydroxymethyl-2-propyl, adamantyl or lower cycloalkyl; R^2 is hydrogen or loweralkyl and the pharmaceutically acceptable acid addition salts thereof.

4,463,191

PROCESS FOR THE REDUCTIVE ALKYLATION OF AROMATIC NITRO-CONTAINING COMPOUNDS WITH KETONES OR ALDEHYDES

Richard M. D'Sidocky, Ravenna, and Dane K. Parker, Massillon, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 26, 1983, Ser. No. 535,515

Int. Cl.³ C07C *85/08*

U.S. Cl. 564—398 **6 Claims**

1. A process for the reductive alkylation of aromatic nitro-containing compounds with ketones or aldehydes wherein the improvement is characterized in that the reaction is conducted in one-step using a catalyst system that consists of (1) a polymer bound anthranilic acid-Pd complex and (2) a sulfonic acid resin at a temperature from 20°–200° C. and pressure from atmospheric to 35,000 kPa.

4,463,192

PROCESS FOR THE REDUCTION OF AN N-HYDROCARBYL SUBSTITUTED OXAZOLIDINE WITH CARBON MONOXIDE TO FORM THE CORRESPONDING N-HYDROCARBYL SUBSTITUTED ALKANOLAMINE

Roger G. Duranleau, Georgetown, and Kenneth G. McDaniel, Round Rock, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

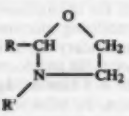
Filed Jul. 5, 1983, Ser. No. 510,789

Int. Cl.³ C07C *85/00*

U.S. Cl. 564—467 **6 Claims**

1. A process for preparing an N-hydrocarbyl substituted alkanolamine which comprises subjecting an N-hydrocarbyl

substituted oxazolidine to a reaction with carbon monoxide at a temperature ranging from 50° to 250° C. and a pressure ranging from 100 to 2500 psig, said oxazolidine being represented by the formula:



in which R is an alkyl radical of 1 to 3 carbon atoms and R' is an alkyl radical of 1 to 10 carbon atoms or a hydroxy alkyl radical of 1 to 10 carbon atoms.

4,463,193

PRODUCTION OF NONCYCLIC POLYALKYLENE POLYAMINES

Thomas A. Johnson, Orefield, and Michael E. Ford, Center Valley, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 19, 1983, Ser. No. 515,314
Int. Cl.³ C07C *85/06*
U.S. Cl. 564—479 **39 Claims**

1. A process for preparing predominantly noncyclic polyalkylene polyamines which comprises:

contacting ammonia or a primary or secondary amine with an alkanolamine compound having an amino group and a primary or secondary hydroxy group and an alkyleneamine compound having two amino groups in the presence of a catalytically effective amount of a Group IIIB metal acid phosphate at a temperature sufficient to effect a reaction among the ammonia or amine, the alkanolamine compound and the alkyleneamine compound under a pressure sufficient to maintain a substantial amount of the ammonia or amine in the reaction zone.

4,463,194

PROCESS FOR MAKING PIPERITONE FROM PLINOLS

Tse-Lok Ho, Jacksonville, Fla., assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 352,787, Feb. 26, 1982, abandoned. This application Nov. 29, 1982, Ser. No. 444,887
Int. Cl.³ C07C *45/45*
U.S. Cl. 568—343 **5 Claims**

1. The process of making piperitone comprising the steps of hydrogenating a crude plinol in the presence of a contact catalyst at a pressure of 100–500 psig to form dihydroplinol, dehydrating the dihydroplinol by heating in the presence of a dehydration catalyst to yield iridene, oxidatively cleaving the alicyclic ring of said iridene with ozone at said unsaturation to form the corresponding diketone, and cyclizing said diketone in the presence of alkali to form piperitone.

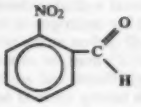
4,463,195

PROCESS FOR PRODUCING O-NITROBENZALDEHYDE

Hans-Rudolf Marti, and René Gnehm, both of Küngoldingen, Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

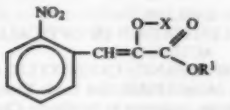
Filed Apr. 14, 1983, Ser. No. 484,842
Claims priority, application Switzerland, Apr. 19, 1982, 2352/82
Int. Cl.³ C07C *45/27*
U.S. Cl. 568—424 **12 Claims**

1. A process for producing o-nitrobenzaldehyde of the formula (1)



(1)

comprising the step of contacting an o-nitrophenyl pyruvate compound of the formula (2)



(2)

wherein R^1 is a C_1–C_4 alkyl group and X is a member selected from the group consisting of monovalent residues of alkali metal atoms, earth alkaline metal atoms and aluminum; and monovalent residues of the formula

in which R^2 is a member selected from the group consisting of hydrogen and C_1–C_3 alkyl groups; with hydrogen peroxide to form a mixture containing said o-nitrobenzaldehyde and recovering said o-nitrobenzaldehyde from said mixture.

4,463,196

PROCESS FOR THE PREPARATION OF CITRAL

Pierre Chabardes, Saint-Foy-les-Lyon, and Emile Kuntz, Lyons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 752,270, Dec. 14, 1976, abandoned. This application May 8, 1980, Ser. No. 147,740
Claims priority, application France, Dec. 19, 1975, 75 39784
Int. Cl.³ C07C *45/67*
U.S. Cl. 568—450 **9 Claims**

1. In a process for the preparation of citral, comprising heating dehydrolinalol at a temperature within the range of 50° to 300° C., in the presence of a vanadium compound containing a group having one of he following formulae:

—V=O, —O—V=O, —V+—O=, and —O—V+—O,

a catalyst, to isomerize the dehydrolinalol to citral, and recovering the citral from the reaction medium, the improvement which comprises the inclusion of an alkanol having 12 to 18 carbon atoms as co-catalyst in the reaction medium.

4,463,197

METHOD FOR PURIFYING PHLOROGLUCIN

Makoto Nakamura, Ibaraki; Tsutomu Chiyoda, Toyonaka, and Shinichi Hasegawa, Otsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 22, 1982, Ser. No. 443,691
Claims priority, application Japan, Dec. 1, 1981, 56-193942
Int. Cl.³ C07C *37/84*
U.S. Cl. 568—754 **1 Claim**

1. A method for purifying crude phloroglucin obtained by an acid-decomposition of 1,3,5-triisopropylbenzene trihydroperoxide in the presence of a solvent followed by evaporation to remove the acetone formed and the solvent, said method comprising the steps of:

(A) extraction-treating the crude phloroglucin with an aqueous alkali liquor in an amount of 4 to 25 times by weight based on the weight of crude phloroglucin and an organic solvent selected from the group consisting of ketones and

esters that are seperable from the aqueous alkali liquor in an amount of 0.05 to 6 times by weight based on the weight of the alkali liquor to form an aqueous alkali extract and an organic solvent extract, said extraction treatment being conducted at a temperature of 10° to 100° C. and a pH of 7.5 to 12;

(B) separating the organic solvent extract from the aqueous alkali extract;

(C) acidifying the separated aqueous alkali extract to obtain phloroglucin crystals; and

(D) subjecting the phloroglucin crystals obtained in step (C) above to a recrystallization treatment in order to further purify the phloroglucin.

4,463,198

METHOD FOR THE REARRANGEMENT OF DIALKYLBENZENE DIHYDROPEROXIDES TO DIHYDRIC PHENOLS

Edward N. Nowak, Akron; William S. Hollingshead, Cuyahoga Falls, and Joel Muse, Jr., Kent, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 23, 1982, Ser. No. 410,613
Int. Cl.³ C07C *37/08*
U.S. Cl. 568—768 **7 Claims**

1. In a process for the acid-catalyzed rearrangement of p-diisopropylbenzene dihydroperoxide to the corresponding dihydric phenol, the improvement comprising introducing into a rearranger, at a rate of from about 60 cc/min to about 100 cc/min, a mixture containing a ketone and from about 12 to about 22% by weight of said p-diisopropylbenzene dihydroperoxide, simultaneously adding, at a rate of from about 0.17 cc/min to about 0.28 cc/min, and continuously mixing with said mixture a solution of an acid catalyst dissolved in a water soluble ketone which is non-reactive with the acid catalyst, the weight ratio of acid to water soluble ketone being from about 1 to 10 to about 5 to 1, and maintaining the mixture of said dihydroperoxide, said acid catalyst and said water soluble ketone at a temperature of from about 80° to 85° with an average resident time of four to five minutes in said rearranger.

4,463,199

METHOD FOR PRODUCING PHLOROGLUCIN

Tsutomu Chiyoda, Toyonaka; Makoto Nakamura, Ibaraki, and Shinichi Hasegawa, Otsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 22, 1982, Ser. No. 443,692
Claims priority, application Japan, Dec. 1, 1981, 56-193939
Int. Cl.³ C07C *37/08*
U.S. Cl. 568—768 **1 Claim**

1. In a method for producing phloroglucin by decomposition of 1,3,5-triisopropylbenzene trihydroperoxide (hereinafter referred to as THPO) in the presence of an acid catalyst at conventional temperatures, the improvement comprising carrying out the method under conditions wherein:

(1) at least one member selected from the group consisting of perchloric acid, sulfuric anhydride and boron trifluoride is used as the catalyst,

(2) the amount of the catalyst above in the reaction solution is 1 to 100 ppm,

(3) the water content in the reaction is not more than 2% by weight, and

(4) the total amount of the carbinol group of carbinols (having a structure in which part or all of the three hydroperoxy groups of THPO have been replaced by hydroxyl groups) contaminating the raw material for reaction is not more than 1/5 equivalent based on THPO.

4,463,200

PROCESS FOR THE PRODUCTION OF PERCHLOROETHYLENE BY CATALYTIC OXYCHLORINATION

William O. Beard, Jr.; Charles R. Cupit, both of Wichita, Kans., and Patricia H. Moyer, Phoenix, Ariz., assignors to Vulcan Materials Company, Birmingham, Ala.

Continuation-in-part of Ser. No. 968,788, Dec. 12, 1978, which is a continuation of Ser. No. 831,188, Sep. 7, 1977, abandoned. This application Jul. 10, 1979, Ser. No. 56,346
Int. Cl.³ C07C *21/12*
U.S. Cl. 570—224 **12 Claims**

1. An improved process for the production of perchloroethylene by oxychlorination of at least one C_2 hydrocarbon, or an incompletely chlorinated derivative thereof, using a copper chloride-alkali metal chloride catalyst mixture deposited in a catalytically effective amount on a carrier, the carrier comprising microspheroidal activated alumina having an average particle size of between about 40 and about 70 microns and a surface area of at least about 100 m^2/g, the weight ratio of copper chloride to alkali metal chloride being above about 1.2:1, the copper chloride calculated as $CuCl_2$, and the reaction being carried out at a temperature and for a time sufficient to produce a reaction product containing perchloroethylene and trichloroethylene in a mole ratio of above about 5:1 and wherein the reaction product contains less than about 150 ppm each on a perchloroethylene weight basis of 1,1,2-trichloroethane and unsym-tetrachloroethane.

4,463,201

PROCESS FOR MAKING SYNTHETIC LUBRICATING OILS

John W. Schick, Cherry Hill, and Robert M. Gemmill, Jr., Pitman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 367,706, Apr. 12, 1982, abandoned. This application Jan. 24, 1983, Ser. No. 460,705
Int. Cl.³ C10L *1/16*; C07C *2/02*
U.S. Cl. 585—10 **8 Claims**

1. A process for preparing a synthetic lubricating oil from a mixture consisting essentially of ethylene, propylene and a higher alpha-olefin having from about 4 to about 10 carbon atoms comprising reacting in a suitable reaction medium under polymerization conditions about 10% by weight ethylene, with propylene and said higher alpha-olefin in the presence of (a) an aluminum-containing catalyst, (b) a vanadium-containing catalyst, and (c) hydrogen with the mole ratio of aluminum to vanadiun varying from about 3:1 to about 9–10:1 and thereafter subjecting the resultant waxy terpolymer oil to dewaxing via urea adduction.

4,463,202

DI-ARYL MONOCHLOROPHOSPHINE WASTE TREATMENT

Gershon J. Davis, White Plains, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 17, 1982, Ser. No. 408,980
Int. Cl.³ C07F *9/52*
U.S. Cl. 568—16 **7 Claims**

1. A method of treating the residue derived from the manufacture of di-aryl monochlorophosphine comprising:

(a) contacting the residue with a solvent at a temperature above 100° C. to form a homogenous mixture;

(b) hydrolyzing the contents of the solution to produce a two-phase mixture comprised of an organic phase and an aqueous phase;

(c) separating and recovering the organic phase.

4,463,203

PROCESS FOR THE PREPARATION OF FUEL OIL, FUEL GAS AND PYROLYSIS COKE BY PYROLYSIS

Kim D. Gi, 27-278, Pa-Dong, Susung-gu, Daegu, Rep. of Korea

Filed Nov. 13, 1981, Ser. No. 321,259
Int. Cl.³ C10B 51/00; B09B 3/00
U.S. Cl. 585—241 1 Claim

1. A process for the preparation of fuel oil, fuel gas and pyrolysis coke by pyrolysis comprising mixing waste rubber, waste synthetic resin, brown coal and bentonite at the ratio of brown coal 48.5 parts, synthetic resin 24.2 parts, rubber 24.2 parts and bentonite 3.1 parts by weight, and generally heating the above mixtures in a pyrolysis reactor while continuing to convey the mixture in the pyrolysis reactor until at the exit of the reactor, the temperature is in the range of 600°–700° C., thereby producing fuel oil, fuel gas, and coke without melted residue of pyrolysis reaction attaching on the surface of the reactor as a solid form.

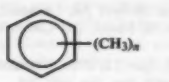
4,463,204

PROCESS FOR ALKYLATING TOLUENE WITH METHANOL TO FORM STYRENE USING A LOW SODIUM CONTENT POTASSIUM/CESIUM MODIFIED ZEOLITE CATALYST COMPOSITION

Huei-Cheng Liu, Oakland, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

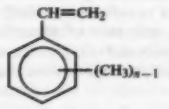
Filed Apr. 22, 1983, Ser. No. 487,590
Int. Cl.³ C07C 1/20
U.S. Cl. 585—437 13 Claims

1. A process for alkylating toluene or toluene derivative with at least one alkylating agent which comprises reacting said alkylating agent with at least one compound represented by the structural formula:



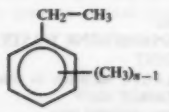
(I)

wherein n is a number which can vary from 1 to 6, said reaction being conducted in the presence of a catalyst composition comprising a crystalline aluminosilicate zeolite of the faujasite structure, under conditions sufficient to form a product comprising at least one compound represented by the structural formulae:



(II)

and



(III)

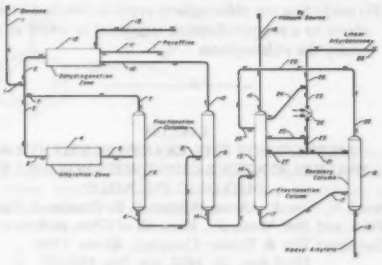
wherein n is a number which corresponds in value to that employed for n in structural formula I, and wherein in said crystalline aluminosilicate zeolite the SiO_2:Al_2O_3 mole ratio is from about 2 to about 8, and the electrovalence of the tetrahedra containing aluminum present therein is balanced by the inclusion in the crystal zeolite structure of cations comprising potassium and cesium which cations are present in amounts sufficient to achieve a potassium to aluminum mole ratio of from about 0.40:1 to about 0.60:1, and a cesium to aluminum mole ratio of from about 0.45:1 to about 0.30:1.

4,463,205

ALKYLATION PROCESS WITH IMPROVED LINEAR ALKYLBENZENE RECOVERY

Joel B. Spinner, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 2, 1983, Ser. No. 529,055
Int. Cl.³ C07C 2/66
U.S. Cl. 585—455 11 Claims



1. A process for the production of alkylaromatic hydrocarbons which comprises the steps of:

(a) contacting a first feed stream comprising a C_7-plus olefinic hydrocarbon with a second feed stream comprising an alkylatable aromatic hydrocarbon and with an alkylation catalyst in an alkylation zone operated at alkylation-promoting conditions and thereby producing an alkylation zone effluent stream which comprises a mixture of monoalkylated aromatic hydrocarbons, dialkylated aromatic hydrocarbons and high boiling point alkylation reaction by-products; and,

(b) recovering a product stream of high purity monoalkylated aromatic hydrocarbon by fractionating the alkylation zone effluent stream in a fractionation zone in which:

(i) a first process stream which comprises the monoalkylated aromatic hydrocarbon, dialkylated aromatic hydrocarbons, and other high boiling point reaction by-products is passed into a first intermediate point of a first fractionation column operated at a subatmospheric pressure;

(ii) a first net bottoms stream comprising the high boiling reaction by-products, dialkylated aromatic hydrocarbons and the monoalkylated aromatic hydrocarbon is removed from the first fractionation column and passed into a second fractionation column operated at a subatmospheric pressure;

(iii) a sidecut stream comprising the monoalkylated aromatic hydrocarbon is withdrawn from the first fractionation column at a higher second intermediate point;

(iv) the sidecut stream is divided into at least a first portion which is withdrawn as the product stream of the process and a second portion which is passed into the second fractionation column at a point above the location at which the first net bottoms stream enters the second fractionation column;

(v) an overhead vapor stream comprising the monoalkylated aromatic hydrocarbon is removed from the second fractionation column and passed into the first fractionation column at a point above said first intermediate point; and,

(vi) a second net bottoms stream comprising the dialkylated aromatic hydrocarbon is withdrawn from the second fractionation column and removed from the process.

4,463,206

PROCESS FOR PRODUCING BENZENE BY HYDRODEALKYLATION OF A HYDROCARBON FRACTION COMPRISING ALKYL-AROMATIC HYDROCARBONS, OLEFINIC HYDROCARBONS AND SULFUR COMPOUNDS

Michel Derrien, Rueil Malmaison, and Jean Cosyns, Maule, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 7, 1983, Ser. No. 456,462
Claims priority, application France, Jan. 7, 1982, 82 00273
Int. Cl.³ C07C 4/12
U.S. Cl. 585—483 8 Claims

1. A process for producing benzene from a stabilized hydrocarbon fraction comprising toluene, xylene or a mixture thereof, sulfur and olefinic hydrocarbons, and having a sulfur content of at least 100 ppm by weight, a bromine number higher than 5, and a maleic anhydride value lower than 4, said process comprising the steps of:

(a) contacting a mixture of said stabilized hydrocarbon fraction and a recycle hydrocarbon fraction from step (e), in the presence of hydrogen, with a hydrodesulfuration catalyst, under hydrodesulfuration conditions comprising a temperature of 250°–400° C. and a pressure of 10–150 bars, so selected as to reduce by at least 90% the sulfur content of said mixture, and to reduce its monoolefin content to such an extent that the bromine number of the resultant effluent is at most 2;

(b) subjecting the unfractionated crude hydrodesulfuration product, containing H_2S, to hydrodealkylation conditions comprising a temperature of 600°–800° C. and a pressure of 5–70 bars;

(c) subjecting the unfractionated hydrodealkylation product to catalytic hydrogenation, at a temperature of 250°–400° C., under a pressure of 10–150 bars, whereby thiophene is converted to other sulfur compounds;

(d) fractionating the catalytic hydrogenation effluent, and separately recovering a gaseous fraction, a product benzene fraction, and a fraction comprising toluene, xylene or a mixture thereof, and containing sulfur, and

(e) recycling at least a portion of said sulfur-containing fraction comprising toluene, xylene or a mixture thereof to step (a).

4,463,207

ARENE ALKYLATION WITH METAL OXIDE-TANTALUM HALIDE/OXIDE CATALYSTS

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 23, 1983, Ser. No. 535,103
Int. Cl.³ C07C 2/70
U.S. Cl. 585—462 18 Claims

1. A process for alkylating benzene and substituted benzenes with an olefin having the general formula, $R'CH_2{=}CH_2R''$, where R′ and R″ are individually hydrogen or alkyl or when taken together form an alkylene group, which process comprises contacting said benzene or substituted benzene with said olefin at a temperature ranging from about 0° C. to about 450° C. with a catalyst comprising pentavalent tantalum, halogen, oxvqen and a metal oxide substrate wherein at least one valence of tantalum is bound to oxygen which is bound to the substrate, at least one valence of tantalum is bound to halogen and the remaining tantalum valences are bound to halogen and/or oxygen which may or may not be bound to the substrate.

4,463,208

TREATMENT OF GRAY MATTER EDEMA

Edward J. Cragoe, Jr., Lansdale, Pa., and Robert S. Bourke, Slingerlands, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 336,107, Dec. 30, 1981, which is a continuation of Ser. No. 184,590, Sep. 5, 1980, abandoned, which is a continuation of Ser. No. 57,637, Jul. 16, 1979, abandoned, which is a continuation of Ser. No. 880,256, Feb. 22, 1978, abandoned. This application Mar. 11, 1983, Ser. No. 474,659
Int. Cl.³ C07C 69/76
U.S. Cl. 562—462 2 Claims

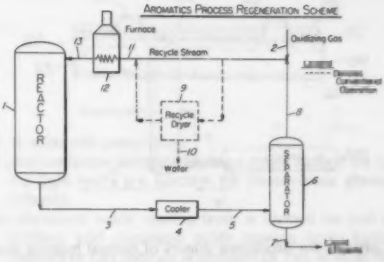
1. The compound, (±)- or (+)- [2-butyl-6,7-dichloro-2-cyclopentyl-2,3-dihydro-1-oxo-1H-inden-5-yl)oxy]acetic acid.

4,463,209

AROMATICS PROCESSING

Christine H. Kursewicz, Haddonfield, and John P. McWilliams, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 121,340, Feb. 14, 1980, abandoned. This application Sep. 19, 1983, Ser. No. 533,618
Int. Cl.³ C07C 2/86, 5/22, 4/12
U.S. Cl. 585—467 17 Claims



1. In a process for the conversion of aromatic containing feedstocks in which said feedstocks are contacted in a reactor vessel, under conversion conditions, with a catalyst comprising a zeolite having a silica to alumina mole ratio of at least 12 and a constraint index within the approximate range of 1 to 12, and which includes a regeneration step to burn off carbonaceous materials which deposit on said catalyst, said regeneration step comprising contacting said catalyst containing carbonaceous materials with oxidizing gas, the improvement which comprises conducting the regeneration step in the presence of steam at controlled regeneration conditions including a steam partial pressure of between about 0.1 psia and about 4.0 psia, a contact time of between about 12 hours and about 72 hours and a temperature of between about 750° F. and about 1000° F.

4,463,210

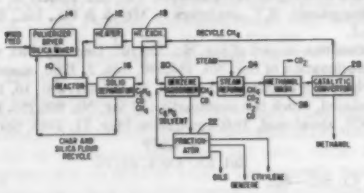
PRODUCTION OF CHEMICAL FEEDSTOCK BY THE METHANOLYSIS OF WOOD

Meyer Steinberg, Melville, and Peter Fallon, East Moriches, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,101
Int. Cl.³ C07C 1/00
U.S. Cl. 585—469 10 Claims

1. A process for the production of ethylene in yields greater than 20%, benzene in yields greater than 12%, and carbon monoxide in yields greater than 45% which consists essentially

of reacting particulate wood with a particle size up to about 6 mm with added methane in a reactor at a temperature of from



about 700° C. to 1200° C. at a pressure of from about 20 psi to 100 psi for a reaction period of from about 0.2 to 10 seconds.

4,463,211

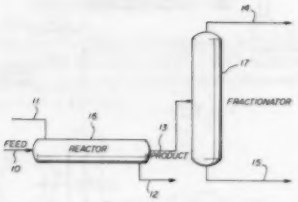
PROCESS FOR OLIGOMERIZATION OF C_2 TO C_{10} NORMAL OLEFINS

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 199,840, Oct. 23, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 425,106

Int. Cl.³ C07C *2/04*

U.S. Cl. 585—510 **7 Claims**



1. A process for producing dimers of normal butenes comprising

(a) contacting a feed in liquid phase containing at least 70 mole % normal butenes having less than 1 mole % isobutene with a fixed bed cation exchange resin having a granular size of about 0.25 to 2 mm in indirect contact with a fluid heat exchange medium at a temperature in the range of 80° C. to 130° C. at a liquid hourly space velocity of 2 to 5,

(b) reacting the n-butenes to form oligomers thereof to form a product stream containing a predominant amount of dimer of normal butenes and unreacted feed components, and

(c) removing said product stream from said reactor.

4,463,212

SELECTIVE OLIGOMERIZATION OF OLEFINS

Tamotsu Imai, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 10, 1982, Ser. No. 448,552

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—530 **4 Claims**

1. A process for the selective oligomerization of butene-2 which comprises treating said butene-2 at oligomerization conditions in the presence of a catalyst composite comprising antimony pentafluoride intercalated in a carbon matrix, and recovering the resultant selective oligomer.

4,463,213

DEHYDROGENATION OF ORGANIC COMPOUNDS WITH A ZINC TITANATE HYDROGEL

Arthur W. Aldag, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 18, 1983, Ser. No. 468,019

Int. Cl.³ C07C *5/327*

U.S. Cl. 585—629 **18 Claims**

1. A process for the catalytic dehydrogenation of at least one dehydrogenatable organic compound which has at least one

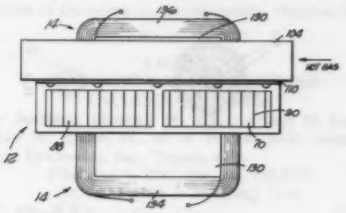
group comprising the step of contacting said at least one dehydrogenatable organic compound under suitable dehydrogenation conditions in the substantial absence of free oxygen with a hydrogel of zinc titanate and a suitable acidic material selected from the group consisting of alumina, silica alumina and a zeolite, wherein the hydrogel of zinc titanate and a suitable acidic material allows a longer reaction period for the catalytic dehydrogenation process than the use of zinc titanate not in a hydrogel form.

4,463,214

THERMOELECTRIC GENERATOR APPARATUS AND OPERATION METHOD

Frank E. Lowther, Chatsworth, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 16, 1982, Ser. No. 358,738
Int. Cl.³ H01L 35/28
U.S. Cl. 136—208 25 Claims



1. A method of operating a thermoelectric generator for generating electrical power in response to heat, comprising the steps of:

cyclically producing increasing then decreasing temperature differences in the thermoelectric material of the generator, including cyclically increasing the temperature of part of said thermoelectric material to at least a temperature exceeding the melting temperature of said material; and

generating a cyclically increasing then decreasing electrical generator output signal, in response to said temperature differences, to transmit electrical power generated by the generator away from the generator.

12. A thermoelectric generator for generating electrical power in response to heat, comprising:

a thermopile to receive the heat and generate electrical power in response to the heat, including a plurality of layers of thermoelectric material of a first type and a plurality of layers of thermoelectrical material of a second type, said layers of said two types having alternating thermoelectric material layer positions in said thermopile, each of said layers of each said type and the next said layer of the other said type being electrically connected to provide, with said plurality of layers of said two types, a substantially linear electrical path through and between said plurality of layers of said two types; and

electrical connector means for transmitting said generated electrical power away from said thermopile,

said thermopile further including a plurality of heat conduction fins each between two said thermoelectric material layers of said two types in said alternating thermoelectric material layer positions, to conduct electrical current between said layers and extending substantially perpendicularly to the direction of said electrical path to a position substantially away from said layers.

4,463,215

CADMIUM SULPHIDE SOLAR CELL

Peter J. Bassett, and Augustinus W. Verheijen, both of Brussels, Belgium, assignors to Prutec Limited, London, England

Filed Mar. 7, 1983, Ser. No. 473,140
Claims priority, application European Pat. Off., Mar. 8, 1982, 82301152.3
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—244 15 Claims

2. In a method of manufacturing a cadmium sulphide solar cell, comprising the steps of:

forming a front contact by coating a transparent substrate with an electrically conductive transparent material;

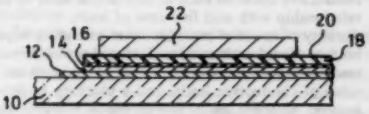
forming over the front contact a layer of cadmium sulphide;

forming a copper sulphide layer over the cadmium sulphide layer to produce a photovoltaic junction; and

forming a rear contact on the copper sulphide layer;

the improvement wherein

the rear contact is formed by co-depositing onto the copper



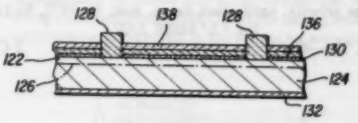
sulphide layer a mixed layer of copper and cuprous containing copper oxide.

4,463,216

SOLAR CELL

Hirotaka Nakano, Yokahama; Hiroshi Morita, Kawasaki, and Taketoshi Kato, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 20, 1983, Ser. No. 459,586
Claims priority, application Japan, Jan. 28, 1982, 57-10954
Int. Cl.³ H01L 31/06
U.S. Cl. 136—256 2 Claims



1. A solar cell comprising:

a semiconductor substrate having a major surface for receiving light and a p-n junction for photovoltaic generation; wherein

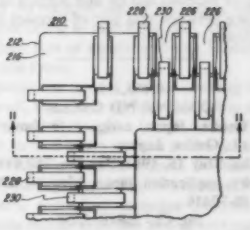
an aluminum oxide coating layer is formed on said major surface; said aluminum oxide coating layer having H radicals or OH radicals in amounts of 1 to 30 atom %, and being substantially in contact with said major surface, wherein an antireflective layer is further provided over said aluminum oxide coating layer.

4,463,217

PLASTIC SURFACE MOUNTED HIGH PINOUT INTEGRATED CIRCUIT PACKAGE

John W. Orcutt, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 14, 1981, Ser. No. 301,856
Int. Cl.³ H05K 5/00
U.S. Cl. 174—52 FP 3 Claims



1. An integrated circuit package comprising:

an enclosure having a top and bottom and a plurality of lateral sides extending between said top and bottom,

wherein a plurality of notches are formed in the periphery of each of said lateral sides;

a first row of conductive leads on each of said lateral sides located on the periphery thereof, and a second row of conductive leads on each of said lateral sides in staggered relationship with said first row of leads;

a plurality of rounded protuberances extending beyond said bottom of said enclosure, each of said protuberances being associated with a conductive lead of said first and second rows of conductive leads, and a plurality of depressions located adjacent each protuberance wherein the inner portion of each said protuberance slopes downward into its corresponding depression, whereby each of said conductive leads bends over one of said rounded protuberances and closely against said sloped inner portion into one of said depressions to prevent the movement of said conductive lead.

4,463,218

SWITCHING ELECTRODE PORTION OF A CIRCUIT BOARD FOR AN ELECTRONIC WATCH

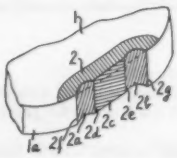
Keiichi Suzuki, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Division of Ser. No. 195,930, Oct. 10, 1980, Pat. No. 4,372,046, which is a continuation-in-part of Ser. No. 935,097, Aug. 21, 1978, abandoned. This application Oct. 14, 1982, Ser. No. 434,467

Claims priority, application Japan, Aug. 24, 1977, 52-113129

Int. Cl.³ H05K *1/02*

U.S. Cl. 174—68.5 **2 Claims**



1. In a circuit board of the type having a pair of major surfaces and a narrow peripheral surface extending between the pair of major surfaces, for use in an electronic timepiece: a narrow peripheral surface of said circuit board having therein a pair of recesses each extending between said pair of major surfaces of said circuit board and spaced apart from each other, a portion of said narrow peripheral surface between said pair of recesses terminating spaced back from an imaginary line extending between respective remote edges of said pair of recesses, and each of said recesses having a respective curvature effective to define an angle greater than an acute angle between a surface of the recess and said narrow peripheral surface of said circuit board at both of said respective remote edges of said pair of recesses; and a conductive layer disposed within said pair of recesses and on said portion of said narrow peripheral surface between said pair of recesses for defining a switching electrode.

4,463,219

COMPOUND CABLE

Kenichi Sato, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

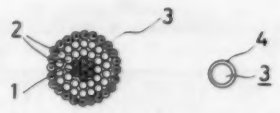
Filed May 15, 1981, Ser. No. 263,919

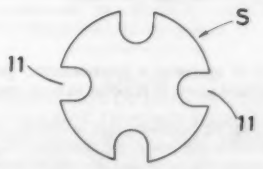
Claims priority, application Japan, May 16, 1980, 55-65615; Jun. 11, 1980, 55-79416

Int. Cl.³ H01B *5/08*

U.S. Cl. 174—127 **5 Claims**

1. A low audible noise compound cable comprising aluminum wire, aluminum alloy wire, aluminum-clad steel wire or aluminum alloy-clad steel wire stranded at least on the outer periphery of the said cable characterized in that the surface of each of said aluminum wire, aluminum alloy wire, aluminum-clad steel wire or aluminum alloy-clad steel wire is treated in water or aqueous vapor of 90° C. or greater so as to cause a hydrated film to form thereon thereby enabling the surface of the cable to have a hydrophilic property, said compound cable being further characterized in that the formation of the hydrated film on the surfaces of the aluminum wire, aluminum





alloy wire, aluminum-clad steel wire or aluminum alloy-clad steel wire constituting the outermost layer of the compound cable is applied to surfaces including more than 3 grooves formed on the outer peripheries of more than 30% of said aluminum wire, aluminum alloy wire, aluminum-clad steel wire or aluminum alloy-clad steel wire continuously and longitudinally thereof.

4,463,220

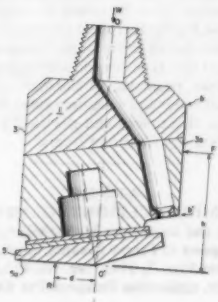
DRILL BIT FOR FORMING A FLUID CUSHION BETWEEN THE SIDE OF THE DRILL BIT AND THE SIDE WALL OF A BORE HOLE

Eduardo B. Gonzalez, Ave. Universidad Num. 482, Mexico 13, D.F., Mexico

Filed May 28, 1981, Ser. No. 267,794

Int. Cl.³ E21B *10/18, 10/60*

U.S. Cl. 175—343 **4 Claims**



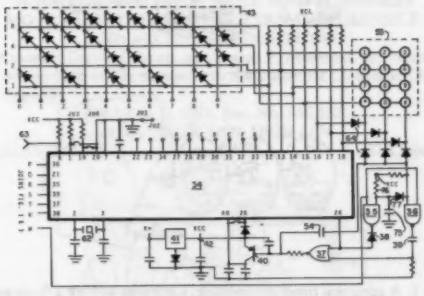
1. In a drill bit comprising a body having a channel therethrough for carrying drilling fluid for injection into a borehole through a nozzle at one end thereof and a cutting head mounted in said body and contacting the bottom of the borehole; the improvement comprising at least one passage extending from said channel to a side portion of the exterior surface of said body, said side portion of the exterior surface of said body being positioned on the opposite side of the body from

the side in which said cutting head contacts the bottom of the borehole wherein drilling fluid in said channel will flow through said at least one passage to the exterior of said body and form a fluid layer between the side portion of said body and the opposing side of the borehole thereby providing a hydraulic cushion therebetween such that contact between said side portion of said body and the opposing side of said borehole, as a result of the reaction force of the cutting head and bottom of the borehole, is substantially eliminated.

4,463,221
AUTOMATIC RADIO TELEPHONE ENCODER/DECODER

Charles Soulliard; Herschel W. Ward; Arthur D. Gass, and Andrew M. Hudor, Jr., all of Tucson, Ariz., assignors to Midian Electronics, Inc., Tucson, Ariz.

Filed Apr. 1, 1981, Ser. No. 250,076
Int. Cl.³ H04M *1/26*; H04Q *7/04*
U.S. Cl. 179—2 EB **37 Claims**



1. An automatic radio telephone encoder/decoder of the type which encodes and decodes telephone dialing codes on an audio dialing code carrier tone, comprising:

means for generating telephone dialing codes;

a microcomputer programmed to encode telephone dialing codes for transmission in response to inputs from said means for generating telephone dialing codes, including means for reading said telephone dialing codes as individually presented key inputs, means for determining the relative sequence of said key inputs of a group of said individually presented key inputs and generating command signals in response to predetermined relative sequences, and to decode received telephone dialing codes, including means for reading a pulse encoded sequence of digits and matching said digits to a preset code, means for time limiting said matching function, means for generating first command functions if said match is achieved or second command functions if said match is not achieved; and

means to automatically turn on said microcomputer for a predetermined period of time.

4,463,222
NOISE CANCELING TRANSMITTER

Lech M. Poradowski, Scarsdale, N.Y., assignor to Roanwell Corporation, New York, N.Y.

Filed Dec. 23, 1981, Ser. No. 334,064
Int. Cl.³ H04M *1/19*
U.S. Cl. 179—121 D **1 Claim**

1. A noise-canceling transmitter for a communications handset, comprising:

a. an elongated casing having a transmitter end and a receiver end and adapted to be supported in an operating position with the transmitter end near the mouth of the user, said transmitter end being oblong and having a primary set of apertures opposite the mouth of the user when the casing is in said operating position and three secondary sets of apertures directed at angles of substantially 90° with respect to the apertures of the primary set;

b. a microphone within the transmitter end of the casing, including:

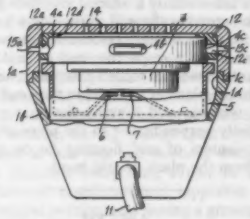
1. housing means having a primary opening aligned with at least one aperture of the primary set and three secondary openings, each aligned with at least some apertures of one of the three secondary sets of apertures; and

2. a diaphragm within the housing means supported at its periphery and separating first and second chambers, said first chamber receiving acoustic waves through the primary opening, and said second chamber receiving acoustic waves through the secondary openings;

c. one of said three secondary sets of apertures is directed away from the receiver end of the casing, and the other two sets of secondary apertures are each directed perpendicularly to said one set of secondary apertures and in opposite directions to each other;

d. a spacer fitting within said oblong end of the casing only in one orientation, said spacer having a recess to receive the microphone and having one primary and three secondary passages;

e. non-circular interfitting surfaces on the microphone and on the recess in the spacer, so that the microphone is receivable in the recess only in one orientation, said spacer being effective when fitted within the casing and when the microphone is received in the recess to provide acoustic

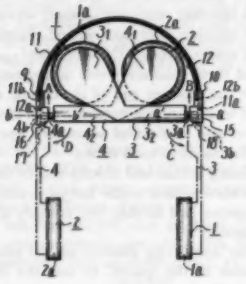


communication from the primary set of apertures through the primary passage and the primary opening to the first chamber of the microphone, and also to provide acoustic communication from the three secondary sets of apertures through the secondary passages and the secondary opening to the second chamber of the microphone;

f. said transmitter end of the casing has a front wall opposite the mouth of the user when the headset is in operation, three side faces extending perpendicularly to said front wall, and a fourth side face slanted with respect to said front wall, said fourth face extending from said front wall toward the receiver end of the casing, said primary set of apertures being in said front wall, and each of said three secondary sets of apertures being located in one of said three side faces;

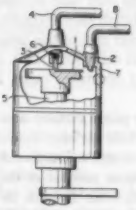
g. said spacer has a plane surface abutting the inside of said front wall, three side surfaces extending at right angles to said plane surface, and a fourth side surface slanted with respect to said plane surface at the same angle that said fourth face slants with respect to said front wall, said primary passage extending through said plane surface and said three secondary passages extending through said three side surfaces, so that said spacer may be received in the transmitter end of the casing only when oriented so that its fourth side surface abuts against said fourth face, said primary set of apertures is aligned with said primary passage, and said three secondary sets of apertures are aligned with said three secondary passages.

4,463,223
HEAD PHONE
Masaru Yamanoi, and Hiroshi Satoh, both of Kawasaki, Japan, assignors to Nippon Columbia Kabushikikaisha, Tokyo, Japan
Filed Jun. 17, 1982, Ser. No. 389,374
Claims priority, application Japan, Jul. 10, 1981, 56-102535[U]
Int. Cl.³ H04R 1/10
U.S. Cl. 179—156 R 7 Claims



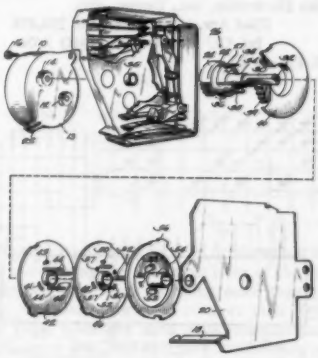
1. A head phone comprising:
(a) an adjustable head band;
(b) a pair of housings each holding an acoustic transducer;
(c) a pair of substantially L-shaped supporting members each having mounted at the end of one leg a housing;
(d) means for articulatingly connecting each of the supporting members to a respective end of said head band for movement between a folded position wherein said housings lie in the plane of and within the head band and a use position wherein said housing lies in a plane extending substantially perpendicular to the plane of the head band and the centers of said housing lie on a common line spaced from the plane of said band.

4,463,224
DISTRIBUTOR FOR SUPPRESSING ELECTROMAGNETIC WAVES OF AN INTERNAL COMBUSTION ENGINE
Yutaka Ookashi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 2, 1983, Ser. No. 463,266
Claims priority, application Japan, Feb. 19, 1982, 57-26611
Int. Cl.³ H01H 9/02; F02P 1/00
U.S. Cl. 200—19 DC 4 Claims



1. An ignition distributor for suppressing electromagnetic waves in an internal combustion engine including a rotary shaft, a distributing electrode connected to said rotary shaft for rotation, a number of circumferentially spaced side terminal electrodes arranged close to the rotary locus of said distributing electrode with a discharge gap being left therebetween, and a distributor cap having said side terminal electrodes fixedly secure therein, said distributor cap including a material which functions to absorb electromagnetic waves radiated from said discharge gap, said material consisting principally of silicon carbide ceramics.

4,463,225
DRYER TIMER
George Obermann, Niles; Erich Kothe, Schaumburg, and William H. Redfield, Lake Forest, all of Ill., assignors to The Singer Company, Stamford, Conn.
Filed Sep. 30, 1982, Ser. No. 428,819
Int. Cl.³ H01H 43/10
U.S. Cl. 200—35 R 10 Claims

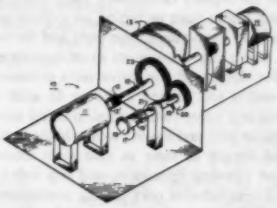


1. A program timer comprising, a housing having a front and a back,
a shaft journaled in the front and the back of the housing and projecting through the front of the housing for manual actuation,
an arbor fixed on the shaft and including a geared portion, said arbor further including a bearing and said arbor also including a sleeve fitting over the shaft and projecting axially towards the front of the housing,
a drive member projecting axially from the arbor,
a plurality of cams journaled on said sleeve and engaged by said drive member,
means on said arbor for spacing said cams one from another,
a motor including an output pinion engaged with said geared portion, and
switch means engaging said cams to be opened and closed in response to rotation of said cams.

4,463,226
TIMING DEVICE DRIVING MEANS
Paul D. Hales, P.O. Box 7573, High Point, N.C. 27264
Filed Dec. 13, 1982, Ser. No. 449,541
Int. Cl.³ H01H 7/00, 43/00
U.S. Cl. 200—35 R 15 Claims

1. Driving means to initiate the activity of a cam operated timer having rotatable cam means positioned on a cam shaft comprising: a first motor means, said first motor means having motor shaft means, said motor shaft means connected to the cam shaft, a clutch means, said clutch means in cooperative engagement with said first motor shaft means and the cam shaft, a second motor means, said second motor means connected to said cam shaft, said second motor means for rotating said cam shaft during the timing cycle independent of said first motor means, cam switch means, said cam switch means for supplying electrical energy to said second motor means, said

cam switch means activated by said first motor means, said clutch means for disengaging said motor shaft means as said



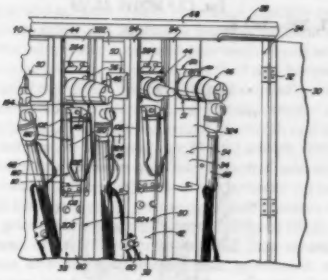
second motor means rotates said cam shaft during the timing cycle.

4,463,227

MOUNTING FOR AN ARTICLE WHICH PERMITS MOVEMENT THEREOF BETWEEN INACCESSIBLE AND ACCESSIBLE POSITIONS

Edmund S. Dizon, Chicago, and Joseph P. Moninski, Jr., Northbrook, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Feb. 5, 1982, Ser. No. 346,432
Int. Cl.³ H01H 9/00; H02B 1/04
U.S. Cl. 200—50 A 21 Claims



18. A mounting arrangement for an article which permits the article to occupy a first, inaccessible position in back of a wall and a second, accessible position in front of the wall, the wall being flat and having a symmetrical opening therethrough, the opening having an axis of symmetry, the mounting arrangement comprising:

a panel having opposed first and second surfaces and an axis of symmetry between first and second ends, said panel having a shape and size capable of substantially covering the opening when said panel is in either of its first and second positions, the respective locations of the first and second ends of said panel when said panel is in the first position being displaced 180° from their respective locations when said panel is in the second position;

means for affixing the article to the first surface of said panel; and

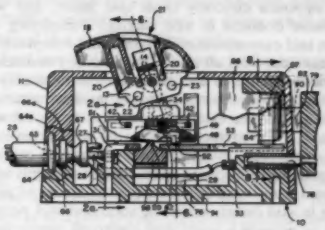
means for attaching said panel to the wall so that said panel can be selectively translated end-for-end about its axis of symmetry relative to the opening between its first and second positions, the article and the first surface of said panel being inaccessibly located in back of the wall and the second surface of said panel being in front of the wall when said panel is in the first position, the article and the first surface of said panel being accessibly located in front of the wall and the second surface of said panel being located in back of wall when said panel is in the second position, said panel substantially blocking the opening and the axes of symmetry of the opening and said panel substantially coinciding when said panel is in both its first and second positions.

4,463,228

PORTABLE ELECTRICAL SWITCH AND OUTLET UNIT

Thomas F. Osika, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Jan. 7, 1983, Ser. No. 456,367
Int. Cl.³ H01R 13/70
U.S. Cl. 200—51 R 3 Claims



1. A portable electrical outlet-receptacle unit having a safety switch for control of ON and OFF circuit conditions at said outlet-receptacle, comprising in combination:

(a) a molded base member of insulating material having elements for said unit supported, retained in position, and maintained thereon, said base member having an outlet-receptacle with elements therefor at one end portion, an extension cord as an element at the opposite end portion for connection to an electrical source, and a safety switch mechanism having elements intermediate said end portions for closing and opening a circuit from said extension cord electric source to said outlet-receptacle;

(b) said base member having spaced apart upstanding integral portions at said one end portion, with said outlet-receptacle elements comprising a pair of spaced apart contact elements positioned and supported by said upstanding integral portions and having a ground connection element spaced from and below said contact elements and intermediate the position of the same, with said base member having a channel therein for supporting and retaining said ground connection element;

(c) said base member having a recess construction therein at said opposite end portion with said extension cord maintained at said recess construction and said extension cord having multiple conductors therein including a ground conductor electrically connected to said ground connection element and a pair of conductors for electrical connection to corresponding respective stationary contacts, such latter stationary contacts being elements in said switch mechanism;

(d) said base member further having integral upstanding spaced-apart portions substantially centrally thereof having carriage-guiding slots, with said switch mechanism elements including a movable carriage of insulating material having protrusions thereon positioned in said slots to position and maintain said carriage intermediate said upstanding portions and to control longitudinal movement of said carriage in a switching operation, with said movable carriage having therewith a pair of contacts movable in a longitudinal direction upon movement of said carriage to move the same in a longitudinal direction in a path defined by said slots and protrusions, and actuator means operatively connected with said carriage for said longitudinal movement of said carriage;

(e) said base member still further having a recess therein accommodating and maintaining an insert of insulating material with a hump thereon positioned in the movement path of said carriage and said pair of contacts therewith;

(f) said base member likewise having two said corresponding respective stationary contacts positioned and maintained as a pair therein by said base member with each electrically common to a corresponding outlet-receptacle contact, and having two stationary contacts also positioned and maintained therein as a pair by said base member and longitudinally spaced by said insert from said first-named two stationary contacts and respectively electrically common to said pair of conductors in said extension cord, with one pair of said two said stationary contacts extending in one direction from said insert and the other pair of said two stationary contacts extending in the opposite direction from said insert, and with said movable contacts in said carriage completing a circuit from said extension cord to said outlet-receptacle when in engagement with all said four stationary contacts; and

(g) a molded cover of insulating material releasably retained on said base member and having inside structure integral with said cover extending into the space between said spaced apart contact elements of said outlet-receptacle and cooperating with said base member in retaining and maintaining said spaced apart contact elements in position on said base member to receive the blades of an electric plug in said outlet-receptacle such that said portable unit acts to provide a controlled electrical circuit therefrom, with said cover having an opening through which said actuator means extends, an opening therein to permit access to said spaced apart contact elements for insertion of the blades of an electric plug, and having a portion for engaging said extension cord to grip and maintain said extension cord at said recess construction with said base member and cover.

4,463,229

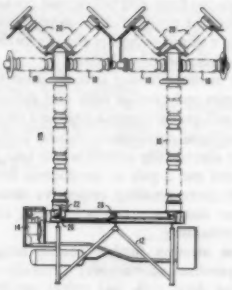
PNEUMATIC OPERATING MECHANISM FOR A CIRCUIT BREAKER

Willie B. Freeman, Irwin, and Richard M. Span, Penn Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 13, 1981, Ser. No. 321,136

Int. Cl.³ H01H *33/42, 35/38*

U.S. Cl. 200—82 B **2 Claims**



1. A circuit breaker, comprising:

a pair of cooperable separable contacts, at least one of which is movable;

a pneumatic operating mechanism having a driving piston within an operating cylinder and an opening valve assembly controlling the admission of high pressure air to said operating cylinder for effecting movement of said one movable contact; and

linkage means interconnecting said driving piston to said one movable contact;

said opening valve assembly including a trip valve piston within a trip valve piston bore, a trip valve, a trip valve shaft connecting said trip valve piston to said trip valve, and means for rapidly eliminating pressurized air from said trip valve piston bore at a predetermined time during an opening operation;

said means for rapidly eliminating pressurized air from said trip valve piston bore including an exhaust port disposed between said trip valve piston bore and the outside atmosphere, and a trip valve stem extension disposed on said trip valve shaft, said trip valve stem extension being disposed within and having a sliding fit with said exhaust port, said trip valve stem extension being movable within said exhaust port and sealing said exhaust port for a predetermined length of time as said stem extension moves during an opening operation, said trip valve stem extension and said exhaust port having predetermined diameters which determine the rate at which said pressurized air is eliminated from said trip valve piston bore, said trip valve stem extension having a predetermined length which determines the length of time said stem extension seals said exhaust port, removal of the sealing of said exhaust port causing the pressurized air in said trip valve piston bore to be eliminated and to close said trip valve.

4,463,230

ELECTRIC POWER CIRCUIT BREAKER

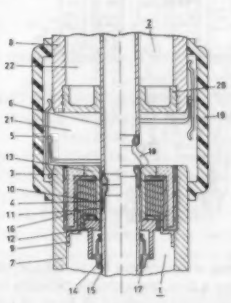
Blaise Perrenoud, La Neuveville, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Sep. 13, 1982, Ser. No. 417,450

Claims priority, application Switzerland, Sep. 16, 1981, 5970/81

Int. Cl.³ H01H *33/18*

U.S. Cl. 200—147 R **4 Claims**



1. An electric power circuit breaker, comprising:

a pair of relatively movable switching elements each including a main power contact and an arcing contact, said main power contacts and said arcing contacts being movable into and out of engagement with one another, respectively;

a cylindrical coil connected between the main contact and the arcing contact of one of said switching elements;

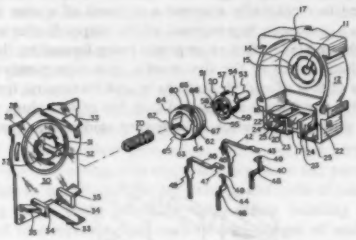
an arc-commutating ring disposed at the end of said one switching element and facing the arcing contact of the other switching element, said ring being electrically connected to the arcing contact of said one switching element; and

a magnetic core within the interior of said coil, said core being comprised at least partially of ferromagnetic material and being displaceable along the axis of said coil such that said core is disposed in only a portion of the interior of the coil when the circuit breaker is in a circuit making position, and is flush with a surface of said ring to close off the interior of the coil when the circuit breaker is actuated.

4,463,231
PUSH-PUSH SWITCH

Steven R. Cooper, Elkhart, Ind.; Thomas W. Flanders, Edwardsburg, Mich., and David M. Hughes, Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Aug. 26, 1982, Ser. No. 411,655
Int. Cl.³ H01H 13/64
U.S. Cl. 200—153 J 14 Claims

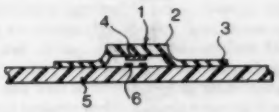


1. A switch comprising a housing having integrally formed regularly spaced gear teeth on an interior housing surface, a pair of conductive engagable and disengagable switch arms mounted within said housing, actuator means having a plurality of internal gear teeth and regularly spaced external gear teeth complementary with the gear teeth of said housing, a stationary backing spaced from said housing surface and having a plurality of gear teeth, the gear teeth of said stationary backing complementary with said internal gear teeth, means for mounting said actuator means in an axial floatable relation between said housing and stationary backing, resilient spring means positioned to bias the external gear teeth of said actuator means into engagement with the gear teeth of said housing and permitting axial movement disengaging said external gear teeth from the gear teeth of said housing, cam means coupled to said actuator means for rotational movement therewith and including a cam surface for engaging one of said switch arms, and means for effecting selective axial movement of said actuator means to disengage the gear teeth of the actuator means and housing and bias the internal gear teeth of said actuator means against the gear teeth of said stationary backing to effect angular movement of said actuator means and cam means, said spring means effecting an opposite axial movement of said actuator means whereby said internal gear teeth disengage from the gear teeth of the backing and the external gear teth re-engage the gear teeth of said housing to effect further rotational movement of said actuator means and cam means.

4,463,232
MEMBRANE SWITCH HAVING SPACER POSTS

Masao Takakuwa, Sayama, Japan, assignor to Toho- Polymer Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 387,020
Int. Cl.³ H01H 13/70
U.S. Cl. 200—159 B 5 Claims



1. A pushbutton switch in which a movable contact carried on a deformable support member may be contacted with or separated from an opposing fixed contact for closure or opening of the contacts, said pushbutton switch comprising

a base portion having a flat upper surface mounting said fixed contact,

a pushbutton member having a flat bottom surface mounting said movable contact,

a skirt portion of resilient insulating material coupling said pushbutton member to said base portion and being of sufficient height to position said pushbutton member in an open position in which said movable contact is spaced above said fixed contact and in registry therewith, whereby upon manual depression of said pushbutton member, the resilient skirt portion deforms to permit lowering of said pushbutton member to a closed position in which said movable contact engages said fixed contact,

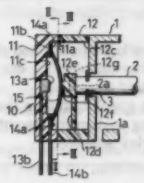
said pushbutton member being relatively rigid, whereby said pushbutton member is subject to tilting when manually depressed in a centrally-offset region,

and at least one post depending from the flat bottom surface of said pushbutton member and being spaced from and proximate to said movable contact, said post being of lesser height than the thickness of said movable contact and being spaced above said base portion upper surface in the open position of said pushbutton member, said post being made of a material having a high coefficient of friction and being positioned to engage the flat upper surface of said base portion when said pushbutton member is moved to its closed position, whereby to prevent tilting of said pushbutton member relative to said base portion and to retard transverse shifting of said pushbutton member relative to said base portion.

4,463,233
PUSH SWITCH HAVING A DRIVE MEMBER FORMED UNITARILY WITH THE HOUSING

Osamu Tanabe, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,608
Claims priority, application Japan, Feb. 10, 1982, 57-17520[U]
Int. Cl.³ H01H 3/12
U.S. Cl. 200—159 A 6 Claims



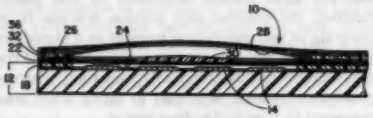
1. A push switch adapted to be mounted rearwardly of a rotary variable resistor having an operating shaft adapted to be rotated to vary the resistance value of said resistor and movable axially to actuate the push switch, said operating shaft having a portion extending rearwardly of said variable resistor, the push switch comprising a housing adapted to be mounted to the rear of said rotary variable resistor and having a plurality of spaced contacts joined electrically together and spaced around peripheral portions of a rear wall portion of said housing, a stationary contact located centrally in the rear wall portion of said housing, a movable contact having a peripheral portion adapted to continually engage said spaced contacts and a bulbous central portion extending away from said stationary contact, and means formed unitarily with said housing for holding an end portion of said operating shaft and engaging the bulbous central portion of said movable contact for pressing said bulbous central portion into engagement with said stationary contact upon movement of said operating shaft axially outwards from the rotary variable resistor.

4,463,234

TACTILE FEEL MEMBRANE SWITCH ASSEMBLY

William W. Bennewitz, Milwaukee, Wis., assignor to Centralab Inc., Milwaukee, Wis.

Filed Nov. 2, 1983, Ser. No. 548,066
Int. Cl.³ H01H 13/48, 13/52
U.S. Cl. 200—159 B 1 Claim



1. In a membrane switch assembly of the type including an insulating substrate having attached to its inner surface first conductive contact portions of at least one switch; and insulated spacer layer overlying and secured to said substrate and having at least one aperture therein, said aperture providing open access to the conductive contact portion of at least one of said switches; and a flexible membrane overlying and secured to said spacer layer and having attached to its inner surface second conductive contact portions of said switches, each of said second conductive contact portions being disposed in alignment with one of said apertures and said first conductive contact portions and spaced from the latter such that each of said switches is normally open, the improvement comprising:

a force actuator comprising a raised area of controlled thickness located on the top of said flexible membrane and centered within an area defining said second conductive contact portions on the opposite side of said membrane such that said controlled thickness area is disposed in alignment with one of said apertures and in a plane above said aperture;

said controlled thickness area serving as a force actuator;

a dome enclosure layer with an adhesive on one side and having at least one circular pocket cut out therein for locating each dome during assembly, said dome enclosure layer being secured to and positioned above said flexible membrane layer such that said controlled thickness area is centered within said circular pocket cutout;

a metal snap dome positioned inside said dome enclosure pocket;

an overlay adhesive layer positioned above said dome enclosure layer and having portions cut out corresponding to the position of said dome; and

an overlay having graphic indicia thereon for each switch position covering said entire assembly and secured to the top of said overlay adhesive.

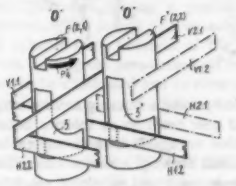
4,463,235

SWITCH WITH SEVERAL LAYERS OF CROSSING POINTS

Alain Gentric, 27 Lotissement Keranroux, F-22300 Lannion, and Michel Lahaussois, 1, rue Anatole le Bras, F-22560 Trebeurden, both of France

Filed Apr. 6, 1981, Ser. No. 251,201
Claims priority, application France, Apr. 15, 1980, 80 08935
Int. Cl.³ H01H 63/00
U.S. Cl. 200—175 13 Claims

1. A multi-layer mechanical crosspoint switch wherein each of said layers comprising a first plurality of spaced parallel wires oriented in a first direction, and a second plurality of spaced parallel wires oriented in a second direction which is substantially perpendicular to the first direction, the first and second layers being piled up one upon the other in an intercalated manner, a frame of insulating material individually associated with each of said layers for supporting each of the wires in said associated layers whereby a cross point is constituted by intersection wires located in neighboring layers, each first layer of said wires being constituted by a plurality of row wires of uneven ranks and a plurality of row wires of even ranks, each second layer of said wires being constituted by a plurality of column wires of uneven ranks and by a plurality of column wires of even ranks, the row wires and the column wires of uneven ranks forming a first matrix, and the row wires and column wires of even ranks forming a second matrix, and rotatable plug means extending perpendicularly through said wires at each of said cross points, a conductor surface on each of said plugs having height of a conductive surface which is sufficient to electrically connect a segment of a wire in one layer to a corresponding segment of the perpendicular wire in a neighboring layer, first cross points being formed by the row and column wires of the first matrix, means responsive to a rotation of first of said plug means in said first matrix for presenting the conductive surfaces of said first of said plugs which extend through said wires and between said row and column



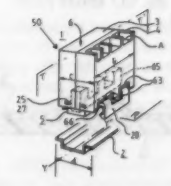
wires of the first matrix and the row and column wires of the second matrix, second cross points being constituted by the row and column wires of the second matrix, means responsive to a rotation of second of said plug means in said second matrix for presenting the conductive surfaces of said second of said plugs which extend through said wires and between said row and column wires of the second matrix and the row and column wires of the first matrix, the first and the second plugs having a larger diameter on the side of the wire layers, each conductive surface of a plug comprising first and second contact surfaces which are electrically connected together, the angular positions of the first and second contact surfaces being shifted by 90° by said rotation of said plugs and the distance in the axial direction along the length of the surface of the plugs which is covered by said conductive surfaces being sufficient to bridge two adjacent layers when said surfaces are shifted.

4,463,236

ELECTRICAL APPARATUS, PARTICULARLY A RELAY OR A SMALL-SIZE CONTACTOR

Jean M. Lesous, Bonnes; Gérard Lerude, Antibes, and Claude Julien, Thenezay, all of France, assignors to La Telemecanique Electrique, France

Filed Sep. 14, 1982, Ser. No. 418,342
Claims priority, application France, Sep. 15, 1981, 81 17721
Int. Cl.³ H01H 9/00
U.S. Cl. 200—295 5 Claims



1. An electrical apparatus which can be dismantled and is adapted to be fitted onto a fixed shaped metal rail provided with a pair of parallel flanges, said apparatus comprising a hollow casing adapted to accomodate an electrical device connected to connection terminals and a removable bottom,

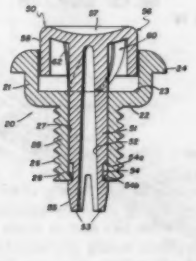
said hollow casing having at least two first opposite side walls distant from each other by a distance (b), two second opposite side walls extending perpendicularly to the two first side walls, a rectangular opening located in the lower area of the hollow casing opposite to the said connection terminals and flanges located in opposite lower areas of said two second opposite side walls of the hollow casing which extend in a direction orthogonal to said two first side walls, the said removable bottom being made of thermoplastic material, presenting a generally rectangular form in order to close said rectangular opening and comprising a pair of opposite flanges extending in a same plane and having a width (a) less than the distance (b) between the said two first opposite side walls of said casing, which is also made from a thermoplastic material, towards which they extend, each of said flanges being provided with a pair of resilient arched parts which are connected with each other by a connecting strip extending in a plane (R) parallel to the plane in which said flanges extend, and each of said connecting strips being provided with a first hooking means adapted to cooperate with each of said flanges of said fixed shaped metal rail, said removable bottom being further provided with second fastening hooks adapted to cooperate in a locking arrangement with flanges provided in opposite lower areas of the two second side walls of said casing.

4,463,237

PUSHBUTTON ASSEMBLY WITH INTEGRAL BIAS MEANS

Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Apr. 13, 1983, Ser. No. 484,448
Int. Cl.³ H01H 3/12
U.S. Cl. 200—340 **12 Claims**



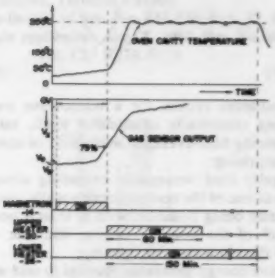
1. A pushbutton assembly comprising a housing including a peripheral side wall and an end wall closing said side wall at one end thereof and cooperating therewith to define a cavity, said end wall having an aperture therethrough, an actuator body extending through said aperture in said end wall for sliding reciprocating movement axially thereof, said actuator body having an enlarged pushbutton head at one end thereof disposed in said cavity, and a flexible resilient blade-shaped bias member unitary with said head and extending therefrom toward said end wall in non-encircling relationship with said body, said bias member terminating at a curved free distal end spaced from said body and disposed so that no portion thereof projects laterally outwardly beyond the lateral periphery of said head, said distal end of said bias member being disposed for engagement with said end wall and deflection thereby back toward said head resiliently to urge said actuator body to a normal rest position wherein said head is spaced from said end wall.

4,463,238

COMBINED MICROWAVE AND ELECTRIC HEATING OVEN SELECTIVELY CONTROLLED BY GAS SENSOR OUTPUT AND THERMISTOR OUTPUT

Takeshi Tanabe, Higashiosaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 127,852, Mar. 6, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 359,128
Claims priority, application Japan, Mar. 6, 1979, 54-26404
The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 B **11 Claims**



1. A combined microwave and electric heating oven comprising:

an oven cavity;

microwave generation source means for supplying microwave energy into said oven cavity for microwave cooking purposes;

electric heater means for electrically heating the ambience within said oven cavity;

a timer system for setting a predetermined period of time

gas sensor means for detecting a concentration of a reducing gas exhausted from said oven cavity and for developing a detection output signal in response thereto;

temperature detection means for detecting the cooking temperature and developing an output signal in response thereto; and

a control circuit for energizing said microwave generating source means and said electric heater means, said control circuit comprising:

first control means for conducting a first mode of cooking operation by energizing said microwave generation source means, said gas sensor means detecting the cooking condition during said first mode of cooking operation, said first control means terminating the first mode of cooking operation in response to said detection output signal from said gas sensor means;

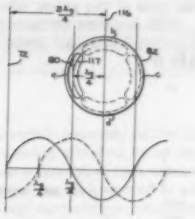
second control means responsive to the termination of the first mode of cooking operation for initating a second mode of cooking operation by energizing said electric heater means, said temperature detection means detecting the cooking condition during the second mode of cooking operation and generating an output signal for maintaining the oven temperature at a desired value, said second mode for cooking operation being terminated after said predetermined period of time.

4,463,239

ROTATING SLOT ANTENNA ARRANGEMENT FOR MICROWAVE OVEN

Matthew S. Miller, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 6, 1982, Ser. No. 447,290
Int. Cl.³ H05B 6/72
U.S. Cl. 219—10.55 F **12 Claims**



1. An excitation system for a microwave oven cooking cavity having electrically conductive walls, said excitation system enhancing time-averaged uniformity of energy distribution and comprising:

a rectangular feed waveguide extending along the outer surface of one of the cooking cavity walls, one wall of said waveguide being common with at least a portion of said one wall of the cooking cavity, said one wall having formed therein a circular opening;

a microwave energy generator coupled to said waveguide to establish a mode therein;

said waveguide having a short circuit termination remote from said generator beyond said circular opening;

a circular metallic disk of greater diameter than said opening mounted for rotation in a plane parallel to and in close proximity to said one wall and having an axis of rotation coaxially aligned with said opening so as to substantially block said opening; and means for rotating said disk; said disk having formed therein an elongated radiating slot, said slot being oriented relative to said disk such that as said disk rotates said slot is alternately oriented to radiate as a series slot and a shunt slot with each quarter revolution of said disk; the spacing of said slot relative to said axis of rotation and said axis of rotation relative to said waveguide short circuit termination being such that maximum coupling of energy from said waveguide to the cooking cavity via said slot is provided at each of the series slot and shunt slot locations; thereby enabling said radiating slot to pass through four maximum energy coupling positions during each rotation of said disk to provide enhanced time-averaged energy distribution in the cooking cavity.

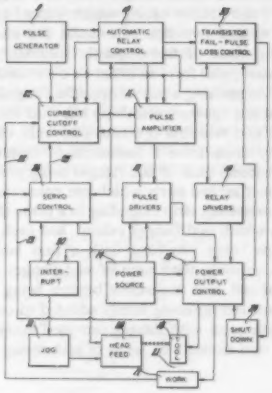
4,463,240

ELECTRIC DISCHARGE MACHINE SERVO CONTROL

Robert W. Drushel, Farmington Hills, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 1, 1981, Ser. No. 298,547
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 G **6 Claims**

1. A servo control system for an electric discharge machining apparatus to control relative movement between a tool and a workpiece defining a gap across which rapidly repeated electrical pulse discharges act to machine the workpiece comprising, in combination, circuit means having high input impedance responsive to gap emf effective to generate a control emf representative of instantaneous gap emf, a storage capacitor, a charging circuit connecting the said circuit means to the said capacitor to transmit the control emf to the capacitor, a high input impedance servo control system responsive to momentary emf of the said storage capacitor to control relative movement of the tool and workpiece to optimize gap width by increasing gap width in response to low storage capacitor emf, a discharge circuit connected to the storage capacitor operable to provide a discharge path from the capacitor of impedance much lower than that of the servo control system input, and logic circuit means responsive to gap emf and to gap discharge



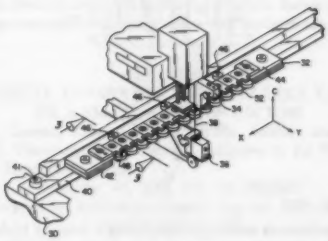
"on" condition effective in response to gap emf below a predetermined threshold during and only during "on" time of the pulse discharges to activate the discharge circuit to rapidly discharge the said storage capacitor so as to drive the servo control system to widen the gap.

4,463,241

FIXTURE FOR ELECTRODE WIRE EDM APPARATUS

Gary W. Smith, New Albany, Ohio, assignor to General Electric Company, Worthington, Ohio

Filed Jun. 28, 1982, Ser. No. 393,225
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 W **8 Claims**



1. In an electrode wire EDM apparatus adapted to cut an electrode workpiece in a cutting zone, wherein said electrode wire and said workpiece are in spaced apart relationship according to a predetermined cutting path traversed by said electrode wire, said workpiece being removably mounted to a fixture which is removably secured to parallel spaced-apart work supports, the space between said work supports and adjacent said fixture defining said cutting zone, the improved fixture for said EDM apparatus which can secure a plurality of said workpieces, which comprises:

(a) a master bar which is secured to said work supports transversely therebetween and within said cutting zone;

(b) a base plate which is removably attached to the upper side of said master bar at a predetermined location thereof, said base plate having a plurality of equally-spaced support locations for said workpieces to rest upon;

(c) a locator plate which is removably attached to the upper side of said base plate at a predetermined location thereof, said locator plate having a plurality of equally-spaced recesses of predetermined configuration along an edge thereof and above said base plate support locations for a side of a workpiece to be held thereagainst; and

(d) a plurality of pre-configured clamps removably attached to the upper side of said locator plate which are tightenable to exert force against the top surfaces of said workpieces for their securing in a precise location for cutting,

edgewise profiles of all components of said fixture being adapted so that each workpiece is secured and non-interfering with said predetermined cutting path.

4,463,242

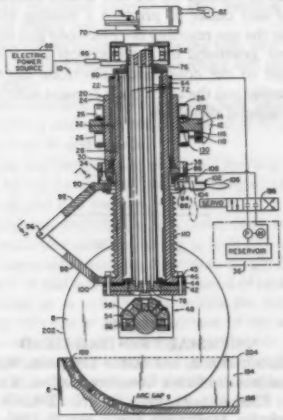
HIGH SPEED ELECTRIC ARC SAW AND METHOD OF OPERATING SAME

Max P. Schlienger, Ukiah, and Whalun Szeto, Novato, both of Calif., assignors to Retech, Inc., Ukiah, Calif.

Division of Ser. No. 793,991, May 5, 1977. This application Sep. 9, 1982, Ser. No. 416,527

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 V **3 Claims**



1. An electric arc saw for sawing a kerf in a metallic object by melting a portion of the object, the saw comprising in combination: an electrically conductive, disc-shaped saw blade having a dished-in configuration when at rest including means for rotating the blade about its axis at a sufficient rate so that the blade assumes a substantially planar configuration during the cutting of the kerf; means mounting the blade and the rotating means relative to the object; feeding means for advancing the blade with respect to the object; an electric power supply operatively coupled with the object and the blade for applying a voltage between the two of a magnitude in the range of between about 15 to about 45 volts; the power supply being constructed so that current density $J_0 = a \cdot 10^6$ amps/-meter^2 can be generated with an arcing gap between a periphery of the blade and a bottom of the kerf in the range of a few tenths of a mm; wherein "a" is in the range of between about 2 to about 16; and current regulating means operatively coupled with the power supply for generating a cutting current density

$$J = J_0 + \frac{\Delta J}{\Delta v} \cdot v \text{ amps/meter}^2\text{; wherein}$$

ΔJ = the incremental change (in amps) in current;

v = blade advancing speed in m/sec;

-continued

Δv = the incremental change $\left(\text{in } \frac{\text{m}}{\text{sec}}\right)$ in blade advancing speed v which results from ΔJ;

whereby the kerf is cut at the greatest possible speed commensurate with the current that can be generated by the power source and that can be carried by the blade and by the object.

4,463,243

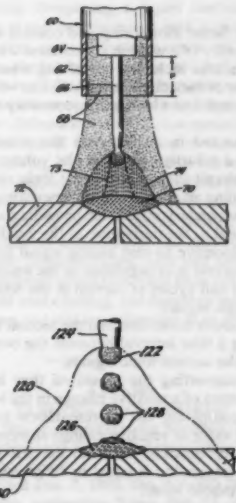
WELDING SYSTEM

John G. Church, Thornhill, Canada, assignor to T.I.M.E. Welding Gas Corporation, Toronto, Canada

Continuation-in-part of Ser. No. 235,220, Feb. 17, 1981, abandoned. This application Aug. 3, 1982, Ser. No. 404,722

Int. Cl.³ B23K *9/16*

U.S. Cl. 219—74 **11 Claims**



1. An electric gas welding process of the type utilized with a welding gun having a consumable electrode-receiving tip, a nozzle coaxial with said tip and radially spaced therefrom to form an annular gas passage, such process including feeding the welding electrode toward a metal joint to be welded, passing current through the electrode to create an electric arc between the end of said electrode and the metal joint, said current melting the end portion of said electrode to cause molten electrode material to be transferred to and fill the weld joint and flowing welding gas through the nozzle to supply the plasma to said electrode and said weld joint, the improvement in said process comprising:

(a) a welding gas mixture consisting essentially of:
- (1) argon from 40% to 70%
- (2) helium from 25% to 60%
- (3) carbon dioxide from 3% to 10%
- (4) oxygen from 0.10% to 1%, and

(b) a current of a magnitude to form molten globules at the tip of the electrode at the rate of 400 to 1200 globules per second, and

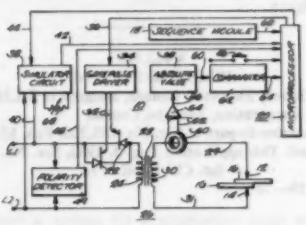
(c) wherein said globules are of a diametral size at least as large as the diameter of said electrode.

4,463,244

AIR CORE TYPE CURRENT PULSE AND POWER FACTOR MONITORING AND CONTROL SYSTEM FOR A RESISTANCE WELDING APPARATUS

William H. Schmeling, Wauwatosa, and Dennis J. Jurek, Grafton, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Dec. 7, 1981, Ser. No. 328,211
Int. Cl.³ B23K 11/24
U.S. Cl. 219—110 8 Claims



1. A power factor monitoring and control system for controlling the quality of a weld in a resistance welding apparatus with said apparatus including a welding transformer having primary and secondary circuits, an A.C. line voltage applied to the primary circuit and a load in the secondary circuit comprising:

means connected in circuit with the primary circuit for detecting a polarity change in the voltage applied to the primary circuit to generate a first logic signal,

means including an air core transformer connected in circuit with the secondary circuit for providing an analog signal proportional to the derivative of the welding current and means responsive to said analog signal for detecting the instants current is extinguished in the secondary circuit at the end of half cycles of current in the weld to generate a second logic signal;

means responsive to the first and the second logic signals for measuring a time interval between the occurrence of the first and the second logic signals,

means for converting the measured time intervals into a representation of a resistive change in the load circuit; and

means for comparing the representation to a preselected threshold value of resistive change representing a quality weld and terminating the weld current when the compared representation is equal to or greater than a preselected threshold value.

4,463,245

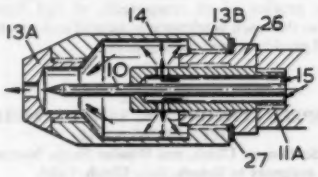
PLASMA CUTTING AND WELDING TORCHES WITH IMPROVED NOZZLE ELECTRODE COOLING

John McNeil, Blackwood, Scotland, assignor to Weldtronic Limited, Scotland

Filed Jun. 23, 1982, Ser. No. 391,009
Claims priority, application United Kingdom, Nov. 27, 1981, 8135838
Int. Cl.³ B23K 9/00
U.S. Cl. 219—121 PM 1 Claim

1. A plasma torch comprising a body mounted on a handle, the body having a through aperture housing a rod electrode which protrudes at one end from the aperture and is releasably clamped to said body by clamp means operated by a clamp actuator at the other end of said aperture, a tubular electrode assembly mounted externally of said body and comprising a consumable electrode nozzle releasably secured to an electrode collar, the latter being releasably secured to the body at said one aperture end and having a thin-walled annular waist portion the arrangement being such that the rod electrode extends substantially co-axially within the tubular electrode assembly and forms an electrode gap with the electrode nozzle, and conduit means are provided through the torch body for directing a supply of ionisable gas under pressure into the electrode gap so as to provide, in use, a plasma stream emergent from the electrode nozzle as a consequence of the inter-electrode electrical arc struck between the rod electrode and the nozzle electrode in the electrode gap in the presence of the ionisable gas,

and wherein said conduit means comprises an annular pathway surrounding the rod electrode and terminating within



the electrode collar of the tubular electrode assembly in generally radially directed apertures whereby the gas is directed to impinge on the thin walled annular waist portion of said collar to produce a cooling effect thereon prior to the gas reaching the electrode gap so that, in use, the heat generated by the electrical arc is substantially confined to the consumable electrode nozzle which is replaceable and the torch body remains substantially thermally isolated therefrom.

4,463,246

THERMAL PRINTING HEAD

Yutaka Tatsumi, Osaka, and Hideo Taniguchi, Kyoto, both of Japan, assignors to Rohm Company Limited, Kyoto, Japan

Filed Aug. 31, 1981, Ser. No. 298,068
Claims priority, application Japan, Sep. 8, 1980, 55-124997
Int. Cl.³ H05B 1/00
U.S. Cl. 219—216 5 Claims

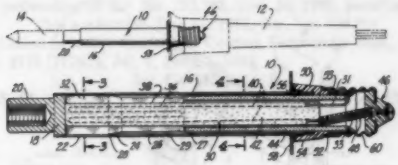
1. A thermal printing head for use in thermal printing, comprising a base of electrically insulating material, a glaze layer formed as a raised surface on said base and having an elongated main portion and an extension portion integral with and extending from one end of said main portion, said extension portion having less glaze per unit area than said main portion to relieve surface tension in said glaze layer during formation of said raise surface adjacent the end of its main body portion, and at least one thermal printing element formed on said main portion of said glaze layer, said thermal printing element including a heating layer formed on said main portion of said glaze layer and a pair of spaced apart electrically conductive layers in contact with said heating layer.

4,463,247

SOLDERING IRON HAVING ELECTRIC HEATER UNIT WITH IMPROVED HEAT TRANSFER CHARACTERISTICS

William Lawrence, Palos Verdes Estates, and Jack Gaines, Long Beach, both of Calif., assignors to Eldon Industries, Inc., Inglewood, Calif.

Filed Dec. 6, 1982, Ser. No. 446,862
Int. Cl.³ B23K 3/02; H05B 3/00
U.S. Cl. 219—236 5 Claims



1. In an electrical soldering iron having a handle, an electrical heating means, a tip member associated with said heating means so as to receive heat from said heating means and means for supplying electrical current to said heating means, the improvement which comprises:

said heating means including a heating unit, said heating unit having attaching means for connecting said heating unit to said handle;

said handle including receiving means, said receiving means for receiving said connecting means so as to connect said heating unit to said handle;

said heating unit including an elongated housing tube having a front end and a back end, said attaching means located at said back end and enclosing the same;

said heating unit including a heat conducting member, said heat conducting member having at least two zones, a first of said zones sized and shaped so as to snugly fit within the front end of said housing tube, a second of said zones sized and shaped so as to be located within the interior of said housing tube and to extend a portion of the way towards said back end of said housing tube, further said second zone having a cross sectional dimension smaller than the cross sectional dimension of the interior of said tube such that a space is formed between said second zone and the interior of said tube;

at least one elongated ceramic heater having a heating element embedded in one end thereof, said heating element emitting heat upon passage of an electrical current through said heating element;

said heat conducting member including at least one opening sized and shaped so as to receive a portion of said ceramic heater, said ceramic heater located within said housing tube with said end of said ceramic heater wherein said heating element is embedded within said opening;

a heat insulating sleeve sized to fit within said housing tube, said sleeve located around the remaining portion of said ceramic heater which is not located within said opening;

said attaching means including a first pair of electrical terminals, said heating element being electrically connected to said first pair of terminals to receive power therefrom;

said means for supplying electrical current including a second pair of electrical terminals located on said receiving means, said second pair of terminals adapted to mate with said first pair of terminals forming an electrical circuit between said means for supplying electrical current and said heating element;

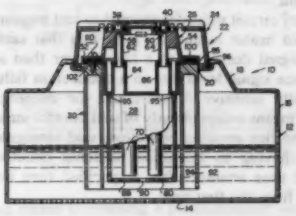
said heat conducting member including a tip connecting means located thereon and projecting out of said front end of said tube housing, said tip connecting means for receiving said tip member.

4,463,248

NON-SPITTING NOISELESS ELECTRIC STEAM VAPORIZER

Lawrence Katzman, New York, and Edward Briggin, Brooklyn, both of N.Y., assignors to Kaz Manufacturing Co., Inc., New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,683
Int. Cl.³ H05B 3/60; F22B 1/30; A61L 9/02
U.S. Cl. 219—284 20 Claims



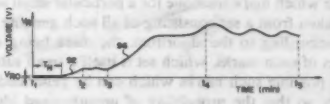
1. A vaporizer comprising a liquid container having an upper opening, a cap positioned on said container overlying said upper opening, said cap having a steam outlet opening and a vent opening, electrodes depending into said container from said cap, at least one tube depending from said cap and communicating with said vent opening, an inner housing cooperating with said cap to define a steam collection space communicating with said steam outlet and including a depending heating chamber surrounding said electrodes and having a water inlet opening therein communicating with the container, an opening between said steam collection space and the interior of said container, said inner housing including isolated conduit means open to said container externally of said heating chamber, said at least one tube communicating with said conduit means to form a closed isolated steam flow path from the interior of said container to said vent opening, and fastening means detachably securing said cap and said inner housing in an assembled condition.

4,463,249

ELECTRIC RICE COOKER

Ryuho Narita, Nagoya, and Terutaka Aoshima, Toyohashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 7, 1983, Ser. No. 501,784
Claims priority, application Japan, Jun. 12, 1982, 57-101082
Int. Cl.³ F27D 11/02
U.S. Cl. 219—441 9 Claims



1. An electric rice cooker comprising:

a cooking kettle for containing rice and water;

electric cooking heater means, provided adjacent to the outside surface of said kettle, for heating said kettle and the contents thereof;

thermally insulative housing means, having a removable lid member, for supporting therein said kettle and said heater means;

measuring means for measuring the actual temperature of said kettle, said measuring means including a thermally sensitive resistor having its resistance value varied in accordance with the variation of said kettle temperature

and producing an electrical measurement signal corresponding to the actual kettle temperature;

cooking control means connected to said measuring means and said heater means, for energizing said heater means a first time so as to start the rice cooking operation and for controlling the supply of power to said heater means in response to said measurement signal, thereby controlling the heating of said kettle by said heater means so as to cause and effective execution of the rice cooking operation; and

emergency circuit means connected to said measuring means and said heater means, for detecting that said measurement signal decreases to a level lower than a specified reference signal level due to a connection failure in said thermally sensitive resistor, and for deenergizing said heater means independently of said control means so as to stop the rice cooking operation, said emergency circuit means having its operation rendered effective from a second time attained after a specified time interval has lapsed from the first time.

4,463,250

METHOD AND APPARATUS FOR USE AGAINST COUNTERFEITING

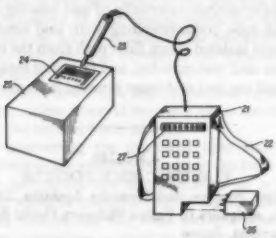
David L. McNeight, 9, Andrews Close, Tarvin, Cheshire, and John G. Lawrence, The Barn, Hollies Lane, Wilmslow, Cheshire, both of England

Filed May 21, 1982, Ser. No. 380,713

Claims priority, application United Kingdom, Jul. 11, 1981, 8121469

Int. Cl.³ A63B *71/06*

U.S. Cl. 235—385 **7 Claims**



1. A method for identifying genuine mass-produced articles from fake articles comprising the steps of applying to said genuine articles an open identifying mark generated by a secret algorithm which mark is unique for a particular small subset of articles taken from a set consisting of all such genuine articles marked according to the algorithm, the mark being selected from a set of such marks, which set is itself a small subset of a set of all possible such marks which can be generated by the algorithm, so that the probability of unauthorized identification of a mark that belongs to the said particular small subset of marks is small, and subsequently inspecting articles to distinguish genuine articles from fake articles which bear fake identifying marks by:

(a) testing a sample of applied marks attached to articles to be identified to determine if said applied marks correspond with the secret algorithm; and

(b) comparing thus tested and applied marks which correspond with the secret algorithm against previously tested marks to determine if there is a higher incidence of repeated marks in the sample than would be expected from the relative sizes of the particular small sub-set of articles identically marked and the set of all genuine articles marked according to the algorithm.

4,463,251

METHOD AND MEANS FOR THE IDENTIFICATION OF A ROLL

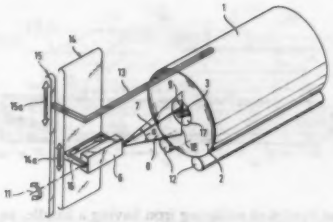
Pauli Koutonen, and Lars-Erik Alanco, both of Järvenpää, Finland, assignors to Oy Wartsila A.B., Helsinki, Finland

Filed Jun. 10, 1982, Ser. No. 387,270

Claims priority, application Finland, Jun. 17, 1981, 811916

Int. Cl.³ G06K *7/14*

U.S. Cl. 235—470 **14 Claims**



1. A method for the identification of rolls, in particular stationary big paper rolls, by means of a fixed code attached to or marked on the end surface of the roll, which code comprises several characters located side by side and including the first and last character thereof, said method including the steps of reading said code by means of a movable, combined optical beam transmitter-receiver device, scanning by a single narrow beam, a restricted angle in a plane at a scan angular speed, adjusting said scanning to a central position relative to said roll surface, adjusting said scanning to extend slightly over the end limits of said code at its both ends, and turning at a rotational speed said scanning plane until at least one observed sweep over the entire code is obtained by the reception of a signal including said first and last character.

4,463,252

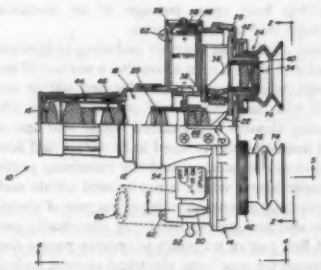
NIGHT VISION GOGGLE SYSTEM

Thomas M. Brennan, Cambridge, and Robert M. Burley, Concord, both of Mass., assignors to Baird Corporation, Bedford, Mass.

Filed Jan. 4, 1982, Ser. No. 337,023

Int. Cl.³ H01J *40/14, 40/00*

U.S. Cl. 250—213 VT **17 Claims**



1. A night vision goggle system comprising:

(a) a housing;

(b) an optical system accommodated within said housing, said system including a pair of eyepiece assemblies;

(c) each of said pair of eyepiece assemblies slidably mounted within said housing for individual lateral adjustment of interpupillary distance;

(d) said optical system compriaing an objective lens assem-

bly, an image intensifier tube, and a collimator lens assembly, all mounted in optical axial alignment; and

(e) a splitter member mounted concentric with said optical axial alignment.

4,463,253

TIME DISPERSION SENSOR TUBE

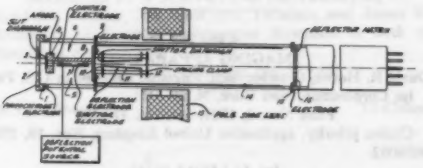
Hartmut Lucht, and Carl-Wilhelm Mönch, both of Berlin, German Democratic Rep., assignors to Akademie der Wissenschaftler der DDR, Berlin, German Democratic Rep.

Continuation of Ser. No. 212,388, Dec. 30, 1980, abandoned. This application Jun. 17, 1983, Ser. No. 504,851

Claims priority, application German Democratic Rep., Dec. 13, 1979, 217621; Jul. 9, 1980, 222492

Int. Cl.³ H01J *31/26*

U.S. Cl. 250—213 VT 9 Claims



1. A time dispersed sensor tube comprising a photocathode for receiving light images which may be in the picosecond range and converting them to photoelectrons, an anode immediately adjacent said photocathode and having a slit diaphragm for accelerating photoelectrons away from said photocathode and for passing said photoelectrons therethrough, a shutter electrode and a counter electrode in the path of said photoelectrons beyond said anode, slit jaws defining a shutter diaphragm beyond said shutter electrode and said counter electrode whereby said photoelectrons impinge on said slit jaws when said shutter electrode is connected to a deflection potential for shutting said tube, a deflection system beyond said slit jaws for deflecting said photoelectrons, a screen positioned to receive and detect said photoelectrons from said deflection system, for providing a strip image, and a short magnetic electron lens mounted between said deflection system and said screen and immediately adjacent said deflection system for focusing said photoelectrons.

4,463,254

MICROBENDING OF OPTICAL FIBERS FOR REMOTE FORCE MEASUREMENT

Charles K. Asawa; Michael K. Barnoski, both of Pacific Palisades, and Shi-Kay Yao, Anaheim, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 27, 1981, Ser. No. 297,058

Int. Cl.³ G01L *1/24*

U.S. Cl. 250—231 R 25 Claims

1. A system for monitoring forces acting upon a structure, comprising:

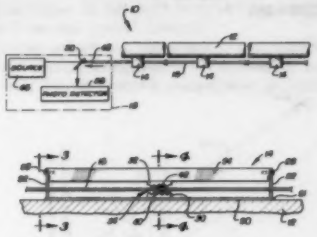
an optical fiber extending along the structure;

a plurality of force transducers each operatively associated with said fiber and mounted on the structure for movement in response to a force acting on the structure to induce microbending of said fiber whereby light passing through said fiber is abruptly attenuated at each microbend therein;

means for launching a pulsed optical signal into said fiber for passage therethrough and for substantially continuous reflection along the length of said fiber of a portion of said signal back through the fiber as backscattered light; and

means for detecting the intensity of said backscattered light as a function of time of reflection whereby each microbend along said fiber is indicated by an abrupt attenuation in said detected intensity and the time of detection is indicative of the location of the microbend along said fiber;

said signal launching means and said detecting means being positioned at a common monitoring station, said signal launching means comprising a light source and said detecting means comprising a photodetector, and including optical means positioned generally adjacent one end of said fiber for direction of said pulsed optical signal into said fiber and for direction of said backscattered light to said photodetector.



4,463,255

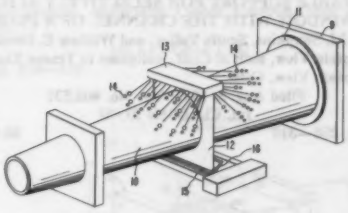
APPARATUS FOR ENHANCED NEUTRALIZATION OF POSITIVELY CHARGED ION BEAM

David A. Robertson, West Newbury, and Norman L. Turner, Gloucester, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 190,297, Sep. 24, 1980, abandoned. This application Dec. 20, 1982, Ser. No. 450,819

Int. Cl.³ H01J *37/317*

U.S. Cl. 250—251 17 Claims



1. An apparatus for enhanced neutralization of a beam of positive ions in an ion implantation system, comprising:

an electron source for generating a primary electron beam; and

means responsive to said primary electron beam for providing controllable secondary electron emission independently of said beam of positive ions, said secondary electron emission means comprising a dummy target for emitting secondary electrons having lower energies than said primary electron beam when stimulated by bombardment by said primary electron beam, said dummy target being positioned adjacent to but not in the path of said beam of positive ions within said system to permit said secondary electrons to be entrapped within said positive ion beam.

4,463,256

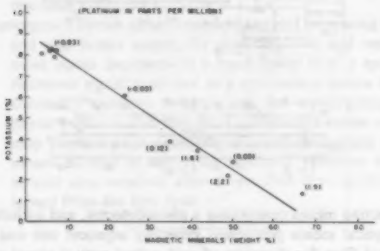
METHOD FOR DETERMINING THE PRESENCE OF PLATINUM IN EARTH FORMATIONS

Eric P. Dion, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 15, 1982, Ser. No. 434,444

Int. Cl.³ G01V *5/00*

U.S. Cl. 250—256 **12 Claims**



1. A method for determining the presence of platinum associated with magnetic materials in earth formations, comprising the steps of:

(a) calibrating a spectral gamma-ray analysis system with a specified mineral of known gamma-ray emitting content whose presence bears a known correlation to the content of select magnetic minerals in earth formations, whereby the gamma-ray count rate of said spectral gamma-ray analysis system is related to the concentration of said specified mineral,

(b) measuring the natural gamma radiation of at least a sample of said earth formation with said calibrated spectral gamma-ray analysis system, and

(c) identifying the presence of platinum in said at least a sample of said earth formation when the measured natural gamma radiation relates to a concentration of the specified mineral correlating with a magnetic material content of a specified weight percent.

4,463,257

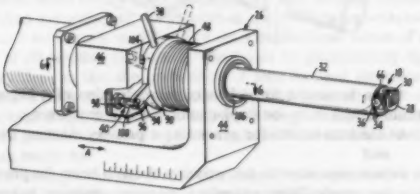
ROTATABLE SUPPORT FOR SELECTIVELY ALIGNING A WINDOW WITH THE CHANNEL OF A PROBE

Gideon M. Simpkins, Scotts Valley, and William E. Drummond, Mountain View, both of Calif., assignors to Tracor Xray Inc., Mountain View, Calif.

Filed Aug. 5, 1982, Ser. No. 405,531

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—310 **30 Claims**



1. In a measurement device which includes an evacuated tubular radiation probe having an open end and an elongated channel formed therein extending from said open end, and with said probe further including a sensing means mounted in said channel, such that radiation entering said open end of said probe will travel along said channel to said sensing means and with said probe being provided with a mechanism for selectively aligning at least a first window with the open end of said channel, said mechanism comprising:

a cap means rotatably mounted at said open end of said probe, with the axis of rotation of said cap means being perpendicular to the longitudinal axis of said probe, said cap means being rotatable between a first position and a second position, and with the adjacent surfaces of said cap means and said probe being provided with a complementary spherical configurations and with a means being provided to effect a seal between said adjacent surfaces, and wherein said first window is mounted on said cap means in a manner such that said first window is aligned with said channel of said probe when said cap means is oriented in said first position and with said first window being moved out of alignment when said cap means is oriented in said second position, whereby the rotation of said cap means permits the selective alignment of said first window with said channel.

4,463,258

IMAGING APPARATUS

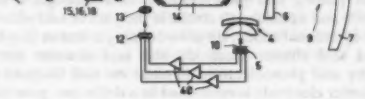
David R. Horne, Crowborough, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,106

Claims priority, application United Kingdom, Nov. 10, 1980, 8036082

Int. Cl.³ H01J *31/49*

U.S. Cl. 250—334 **7 Claims**



1. An apparatus for producing a visible image of a scene by sensing non-visible radiation from the scene, said apparatus comprising:

a mirror assembly which is rotatable about an axis, said assembly comprising a number, n, of planar mirrors disposed equiangularly around the periphery thereof, each planar mirror subtending a different tilt angle with respect to the axis, a cross-section through the mirror assembly in a plane perpendicular to the axis taking the shape of a regular polygon;

an objective lens arranged to receive radiation from the scene after the radiation is reflected by a planar mirror which is at a scanning location, said lens having a focal length;

a linear array of radiation-sensitive detectors arranged to receive radiation from the scene which is reflected by a planar mirror at the scanning location and which passes through the objective lens, said array having a linear length and an angular length, the angular length being equal to the linear length of the array divided by the focal length of the objective lens;

a linear array of light sources arranged to emit light onto a planar mirror at a reconstruction location, each light source being coupled to one corresponding detector of the detector array; and

viewing means arranged to receive light reflected by the planar mirror at the reconstruction location from the light sources;

characterized in that;

the scanning and reconstruction locations are selected such that during rotation of the mirror assembly to move a planar mirror from the scanning location to the recon-

struction location, an integral number, x, of planar mirrors pass through the scanning location, the number, x, being chosen such that there is no positive integer, m, less than n where rotation of the mirror assembly to pass mx mirrors through the scan location will terminate with the same mirror at the scan location as the mirror at the scan location at the start of the rotation; and

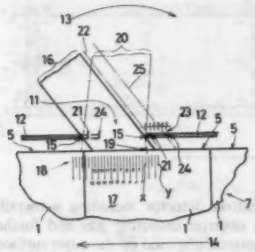
the differences between the tilt angles of the planar mirrors are integral multiples of half of the angular length of the detector array, the differences between the tilt angles of pairs of planar mirrors at the scanning and reconstruction locations, being equal to half the angular length of the detector array for all but one pair of mirrors.

4,463,259

METHOD AND APPARATUS FOR MEASURING THE DISPLACEMENT OF A RADIATION-RESTRICTIVE MARK, AS IN A SURVEYING INSTRUMENT

Peter-John Webster, 339 West Ave, Ferndale, and James B. Roulston, 14 Beech St., Bryanston Extension 3, both of Randburg, South Africa

Filed Mar. 12, 1982, Ser. No. 357,652
Int. Cl.³ G01D *5/40*
U.S. Cl. 250—338 **12 Claims**



1. A method of measuring comprising the steps of:

directing each of a plurality of sources of electro-magnetic radiation, having a predetermined displacement relative to each other in a direction of measurement, to radiate over the receiving areas of a plurality of electro-magnetic radiation sensors also having a predetermined displacement relative to each other in a direction of measurement;

sequentially switching the sources;

moving at least one mark between the sources and the sensors, the mark causing a restriction in a cross-section measurement of the radiation passing beyond it, and the mark moving in a direction of measurement from a reference position to a position determined by the measurement being taken;

detecting any changes in the sensors as a result of movement of the radiation restriction caused by movement of the mark and the switching of the sources;

noting between the switching of which sources each such change occurred; and,

ascertaining what distance the radiation restriction moved to cause the change to occur between the noted sources.

4,463,260

FLAME DETECTOR

Tosiaki Ikeda, Ohtsu, Japan, assignor to Horiba, Ltd., Kyoto, Japan

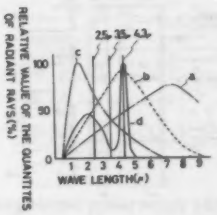
Filed Oct. 5, 1981, Ser. No. 308,853
Claims priority, application Japan, Oct. 18, 1980, 55-145933
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—339 **4 Claims**

1. A flame detector comprising:

first and second and third infrared detectors, said detectors arranged to respectively detect radiation at first, second, and third wavelengths;

first and second comparators operatively connected to said first and second and third detectors, said first comparator providing an output when an output of said first detector is greater than an output from said second detector and said second comparator arranged to provide an output when an output of said third detector is greater than said output from said second detector;

an AND gate operatively connected to said outputs of said first and second comparators for providing an output when said first and second comparators provide an output;



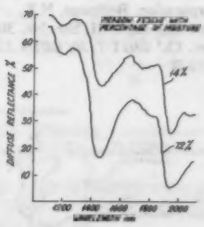
wherein said first wavelength is arranged to be equal to a wavelength of radiation emitted by an object generating a flame to be detected and wherein said third wavelength is arranged to be equal to a wavelength of radiation emitted by said flame to be detected and said second wavelength is arranged to be between said first and third wavelengths, whereby said flame detector detects a valley in the spectrum of infrared radiation emitted from an object generating a flame, said valley in said spectrum being characteristic of an object which is generating a flame and said valley not being present in a heated object which is not generating a flame.

4,463,261

ANALYSIS APPARATUS

George E. Bowman, Clophill, England, assignor to National Research Development Corporation, London, England

Filed Apr. 5, 1982, Ser. No. 365,390
Claims priority, application United Kingdom, May 7, 1981, 8113916
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—339 **14 Claims**



1. Analysis apparatus comprising two light-emitting diodes which emit narrow-band radiation of different wavelengths so that a sample containing a particular constituent differentially reflects radiation emitted from the diodes at the two wavelengths depending on the proportion of the constituent, radiation detection means positioned for receiving radiation from the diodes after reflection from the sample, means for switching the electrical supply currents to the diodes in alternate sequence, and means for varying the ratio of the electrical

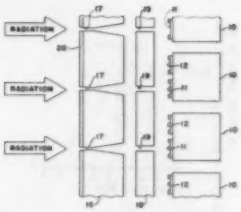
supply currents to the diodes so as to minimise any signal component at the switching frequency in the output of the radiation detecting means.

4,463,262

THICK FILM RADIATION DETECTOR

Ben Contreras, Sedelia, Colo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 21, 1981, Ser. No. 304,123
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—349 **5 Claims**



1. A thick film infrared radiation detector system comprising:

a. a substrate having substantially parallel first and second surfaces and of a material which has high thermal conductivity and which is substantially electrically insulating;

b. a plurality of substantially identical thick film strips of thermistor material deposited in pairs and configured in a retangular array on a first surface of said substrate;

c. a heat shield covering said array and substantially coextensive therewith, for shielding one strip of each said pair in said rectangular array from incident infrared radiation, said shield having a plurality of apertures therethrough for exposing the other strip of each said pair to said radiation;

d. a heat sink in thermal contact with said second substrate surface; and

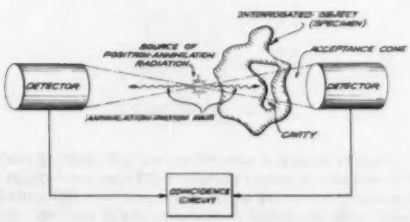
e. means for measuring the electrical resistances of each said strip and comparing the resistances of each pair whereby the intensity profile of the said radiation across the said array may be determined.

4,463,263

POSITRON-ANNIHILATION-RADIATION TRANSMISSION GAUGE

Gerald M. Padawer, East Hills, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,279
Int. Cl.³ G01T *1/20*; G01N *23/00*
U.S. Cl. 250—363 R **8 Claims**



1. A method for nondestructively ascertaining the spatial variation of density within a specimen comprising the steps of:

(a) situating said specimen between a positron-annihilation radiation-emitting source, in which a positron annihilates with an electron to create a pair of photons, and one of a pair of photon-sensitive detectors, said source being located approximately midway along the line-of-sight separating said pair of detectors which are each responsive to one of the photons;

(b) reckoning only time-coincident events sensed simultaneously in both of the detectors;

(c) recording the number of coincidences counted in a preset time interval; and

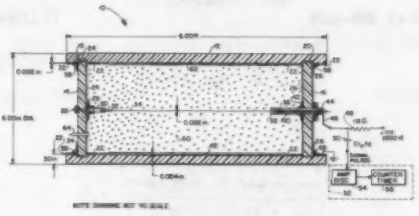
(d) ascertaining the spatial variation of density from corresponding variations in the recorded data.

4,463,264

LIGHTWEIGHT NEUTRON DETECTOR

Charles A. Young; Bruce D. Geelhood, and Dennis M. Silva, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 7, 1982, Ser. No. 386,154
Int. Cl.³ H01J *47/12*; G01T *3/06*
U.S. Cl. 250—390 **20 Claims**



1. In a neutron detector including a metallic encasement containing a neutron detecting gas and further including a moderator material disposed on the outer surface of said metallic encasement, the improvement comprising:

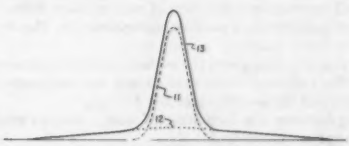
said moderator material being the structural support member for said metallic encasement.

4,463,265

ELECTRON BEAM PROXIMITY EFFECT CORRECTION BY REVERSE FIELD PATTERN EXPOSURE

Geraint Owen, and Paul Rissman, both of Palo Alto, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 17, 1982, Ser. No. 389,306
Int. Cl.³ H01J *3/00*
U.S. Cl. 250—492.2 **8 Claims**



1. An improved lithography method of the type in which particles are directed to impinge on preselected regions of a surface of a workpiece to expose in the workpiece a preselected pattern, said particles producing in the workpiece a total exposure which is the sum of a desired forward exposure to generate the preselected pattern and an undesired backscattered exposure, wherein the improvement comprises the additional step of exposing each pixel in the reverse field pattern with a flux of particles which produces in each of these pixels a total exposure that approximates the backscattered exposure produced in each pixel in the preselected regions, whereby a total exposure is produced that is the sum of the exposure due

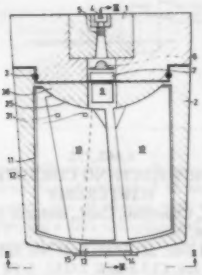
to the particles incident on the preselected regions and the exposure due to the particles incident on the reverse field pixels, said total exposure being the sum of a first component which is the ideal exposure which would result if there were no proximity effect and only the preselected regions were exposed and a second component which is essentially constant over the workpiece.

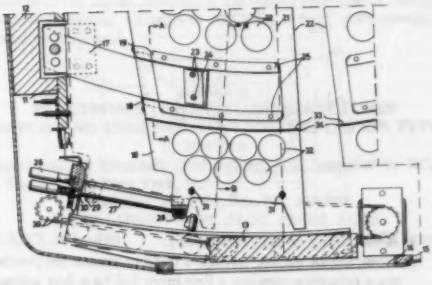
4,463,266

NEUTRON COLLIMATOR

Anders Brahme, Bromma, Sweden, assignor to Instrumeat AB Scanditronix, Sweden

Filed Feb. 20, 1981, Ser. No. 236,199
Int. Cl.³ G21K *1/04*
U.S. Cl. 250—505.1 **13 Claims**





1. A neutron collimator with an adjustable irradiation field for an effective neutron radiation source, comprising:

support means including a plurality of individual carrier means;

frame means in which said support means is mounted;

protective radiation casing means surrounding said frame means;

a plurality of pairs of opposite elongated wedge-shaped slabs arranged side by side such that respective ones of said opposite wedge-shaped slabs form a fan-shaped configuration which converges toward an apex at said neutron radiation source, each wedge-shaped slab having an inner side surface and being mounted for rotational and translational movement on a respective one of said individual carrier means such that the wedge-shaped slabs of each pair are mounted for motion towards and away from each other along a path which intersects said irradiation field for said neutron radiation source and such that the inner side surface of each wedge-shaped slab is always directed generally towards said neutron radiation source; and

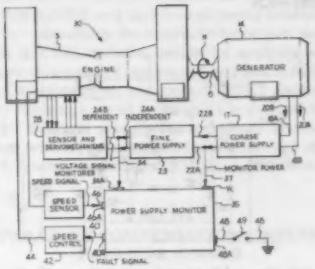
at least one bearing means provided between each wedge-shaped slab and the respective individual carrier means on which it is movably mounted.

4,463,267

POWER SUPPLY MONITOR

William G. Bools, Blue Ash, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 2, 1982, Ser. No. 394,755
Int. Cl.³ F02D *33/00*
U.S. Cl. 290—40 R **11 Claims**



2. In a tracking electric power supply adopted to be driven by a gas turbine engine and having a coarsely regulated power supply stage powering a finely regulated power supply stage, a system for controlling speed regulating equipment of said engine comprising:

(a) means for generating a reference signal;

(b) comparison means for comparing said reference signal with an output signal of said finely regulated power supply stage and for generating a fault signal in response when the difference therebetween reaches a predetermined value; and

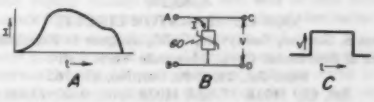
(c) means for coupling said fault signal to said speed regulating equipment.

4,463,268

VARISTORS WITH CONTROLLABLE VOLTAGE VERSUS TIME RESPONSE AND METHOD FOR USING THE SAME TO PROVIDE A RECTANGULAR VOLTAGE PULSE

Lionel M. Levinson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 269,225, Jun. 1, 1981, Pat. No. 4,397,775.
This application May 31, 1983, Ser. No. 499,609
Int. Cl.³ H03K *3/36*
U.S. Cl. 307—106 **7 Claims**



1. A method for producing a rectangular voltage pulse in response to an irregularly shaped current pulse, comprising the steps of:

determining the current level versus time characteristic of an irregularly shaped current pulse, the amplitude of which decreases with time; and

applying said irregularly shaped current pulse to a sintered ceramic, bismuth-free ZnO based varistor containing aluminum oxide and having a voltage undershoot chosen such that application of said current pulse, having said current level versus time characteristic, to said varistor results in the short time, higher current varistor voltage being reduced and substantially equal to the long time, lower current varistor voltage, whereby the voltage appearing across said varistor constitutes a substantially rectangular voltage pulse.

4,463,269

PUMP DRIVE CIRCUIT

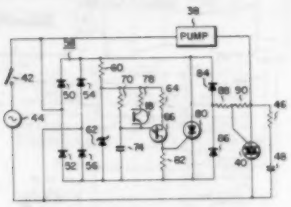
Hiroyuki Yashima, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,370

Claims priority, application Japan, Nov. 2, 1981, 56-176235; Nov. 4, 1981, 56-176916

Int. Cl.³ H02J *13/00*; **G05F** *5/00*

U.S. Cl. 307—129 **9 Claims**



1. A circuit for driving a pump of the type which provides an output level which varies in accordance with the frequency of power source voltage supplied to the pump, wherein the pump output level can be maintained at a desired level notwithstanding the selection of one of two different frequencies of power source voltage, comprising:

an endoscope pump arranged to develop a flow rate according to the frequency and phase of power source voltage connected to said pump;

means for supplying a power source voltage having one of two different frequencies;

means for detecting the zerocross point of the power source voltage to be supplied to the pump and for generating a zerocross pulse signal corresponding to the frequency of the power source voltage;

means for discriminating the frequency of the power source voltage to be applied to the pump in response to the zerocross pulse signal and for providing a corresponding discrimination signal;

means for selecting one of at least two different time constants in accordance with the discrimination signal from said discrimination means; and

means for controlling the phase of the power source voltage to be applied to the pump in accordance with the selected time constant so that a voltage of predetermined phase will be supplied to said pump from said phase control means.

4,463,270

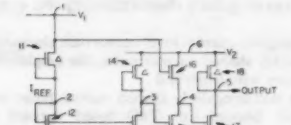
MOS COMPARATOR CIRCUIT

James S. Gordon, Sunnyvale, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jul. 24, 1980, Ser. No. 171,762

Int. Cl.³ H03K *17/687*; **H02J** *7/00, 9/00, 13/00*

U.S. Cl. 307—296 R **11 Claims**



1. A comparator circuit responsive to a change in the difference between a first voltage level at a first terminal and a second voltage level at a second voltage terminal comprising:

a current sensing circuit connected between the first voltage terminal and a reference voltage terminal to thereby cause a first current to flow;

an amplifier connected between the second voltage terminal, the reference voltage terminal and the current sensing circuit to thereby cause a second current to flow in the amplifier, the second current having a known relationship to the first current when the first voltage level is equal to the second voltage level; and

a first inverter having a variable impedance connected to the first voltage level and the amplifier, said variable impedance being controlled by the magnitude of said first voltage level relative to said second voltage level for providing a control signal.

4,463,271

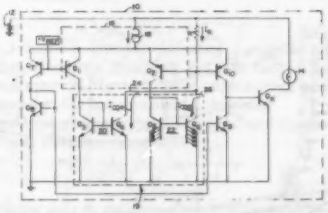
TRANSISTOR SWITCHING CIRCUITRY HAVING HYSTERESIS

Harry A. Gill, Jr., Cupertino, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 28, 1981, Ser. No. 335,292

Int. Cl.³ H03K *5/153, 5/24*

U.S. Cl. 307—350 **10 Claims**



1. A switching circuit, comprising:

(a) comparator means, having: a current source for producing a reference current; a first input fed by a first voltage; and, a second input, such comparator means directing the reference current to either a first one of a pair of outputs or a second one of the pair of outputs selectively in accordance with whether the first voltage is greater than, or less, than a voltage at the second input;

(b) means, including a current mirror fed by the current directed from the current source to the first one of the pair of outputs, for producing a constant current in response to the directed current fed thereto, such constant current having a level independent of an input signal fed to the switching circuit when the current from the current source is directed to the first one of the pair of outputs; and

(c) means, responsive to said input signal, for producing a voltage at the second input of the comparator means equal to the first voltage when said input signal initially passes through a first threshold level and for producing, in response to the constant current and the input signal, the same voltage at the second input when said input signal passes to a second, different threshold level having previously returned to the first threshold level and having then subsequently passed through such first threshold level to the second, different threshold level.

4,463,272
AUTOMATIC DRIFT CORRECTION

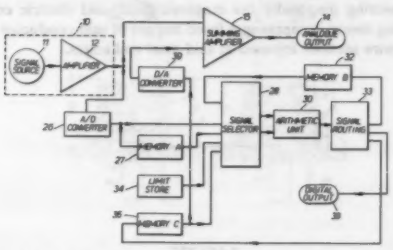
Brian D. Tucker, Ilford, England, assignor to Gould Advance Limited, Hainault, England

Continuation of Ser. No. 305,774, Sep. 25, 1981. This application Dec. 1, 1983, Ser. No. 557,375

Claims priority, application United Kingdom, Sep. 30, 1980, 8031476

Int. Cl.³ H03K *5/24*

U.S. Cl. 307—358 **9 Claims**



1. An automatic drift correction circuit comprising means for sensing the time rate of change of an input signal and for comparing the sensed rate of change with a threshold value, and means for applying a drift compensating value to the input signal when the sensed rate of change is less than the threshold value.

9. A method of automatic drift correction in a circuit providing a signal whose time rate of change when below a threshold value is indicative of drift, comprising sensing the time rate of change of the signal, comparing the sensed time rate of change with a threshold value, and applying a drift compensating value to the signal.

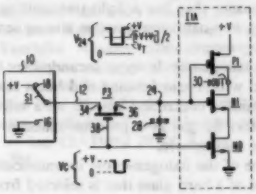
4,463,273
ELECTRONIC CIRCUITS AND STRUCTURES EMPLOYING ENHANCEMENT AND DEPLETION TYPE IGFETS

Andrew G. F. Dingwall, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,849

Int. Cl.³ H03K *19/096, 19/20, 19/003, 3/356*

U.S. Cl. 307—450 **22 Claims**



1. The combination comprising:

a first insulated-gate field-effect transistor (IGFET) of first conductivity type and of the enhancement type;

second and third IGFETs of second conductivity type and of the enhancement type;

a fourth IGFET of first conductivity type and of the depletion type; eah IGFET having a conduction path and a control electrode for controlling the conductivity of said conduction path;

an input line, and an output node;

first and second power terminals for the application therebetween of an operating potential;

means connecting the conduction path of said second IGFET between said input line and the control electrodes of said first and third IGFETs;

means connecting one end of the conduction path of said third IGFET to the first power terminal;

means connecting the other end of the conduction path of said third IGFET to one end of the conduction path of said first IGFET at said output node;

means connecting the conduction path of said fourth IGFET between the other end of the conduction path of said first IGFET and said second power terminal; and

means for controlling the conductivity of said second and fourth IGFETs including means for applying a signal to the gate electrodes of said second and fourth IGFETS for selectively turning-on said second IGFET and for concurrently applying a signal to the gate electrode of said fourth IGFET having a polarity and magnitude to substantially, but not wholly, decrease conduction through said fourth IGFET, when said second IGFET is turned-on.

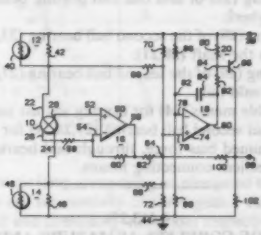
4,463,274
TEMPERATURE COMPENSATION CIRCUIT FOR PRESSURE SENSOR

Craig Swartz, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 1, 1982, Ser. No. 344,900

Int. Cl.³ H03K *17/90;* **G06G** *7/12*

U.S. Cl. 307—491 **10 Claims**



1. A temperature compensation circuit having first and second supply voltage terminals, for temperature compensating an output voltage of a pressure sensor having first and second pressure sensor inputs, said circuit comprising:

a first compensating network coupled between said first supply voltage terminal and said first pressure sensor input for providing a first signal that varies with temperature to said pressure sensor;

a second compensating network coupled between said second supply voltage terminal and said second pressure sensor input for providing a second signal that varies with temperature to said pressure sensor; and

circuit means coupled to said first and second compensating networks and said pressure sensor and responsive to said pressure sensor output voltage and said first and second signals, wherein the summation of said first and second signals substantially eliminates any voltage change due to a temperature change.

4,463,275
THREE-PHASE ALTERNATOR WITH A POSITIVE NON-FLEXIBLY COUPLED FAN WHEEL

Istvan Ragaly, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,592

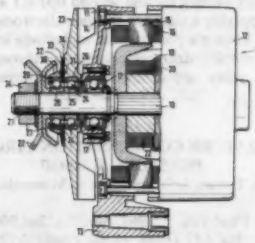
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205757

Int. Cl.³ H02K *7/10;* **F16D** *7/02*

U.S. Cl. 310—78 **9 Claims**

1. A three-phase alternator adapted to be driven by an internal combustion engine at variable speeds, comprising:

a V-belt pulley (22);
a rotor shaft (18,21) to which said V-belt pulley (22) is joined firmly to rotate together with the rotor shaft;
a fan wheel (23), driven by the V-belt pulley (22) by a force-transmitting coupling, including
a hub for holding a ball bearing internally thereof;
means for axially resiliently connecting said hub to said fan wheel;
two ball bearings, each having an inner ring (25,28), an outer ring (26,29), and interposed rolling balls (24,27);
the inner ring (24) of the first one of said ball bearings (24,25,26) being seated on the shaft (18,21);



the outer ring (26) of said one ball bearing being fitted into the fan wheel;
the inner ring (28) of the second ball bearing (27,28,29) being seated on the shaft (28,21);
the outer ring (29) of the second ball bearing (27,28,29) being seated in said hub;
and adjustable means (34) for bearing against said inner ring (20) of said second ball bearing (27,28,29) for producing a predetermined bias force, through said bearings, for said axially resilient connecting means.

4,463,276

COIL UNIT OF CORELESS ARMATURE AND METHOD OF MANUFACTURING THE SAME

Yoshimitsu Nakamura, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP80/00271, 371 Date Jun. 10, 1982, 102(e) Date Jun. 10, 1982, PCT Pub. No. WO82/01626, PCT Pub. Date May 13, 1982
PCT Filed Oct. 31, 1980, Ser. No. 387,870
Int. Cl.³ H02K *1/22*
U.S. Cl. 310—266 **2 Claims**

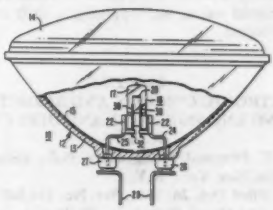
1. A coil unit of a coreless armature for use with means creating a magnetic field, said coil unit comprising at least a pair of inner and outer coil wire layers, said layers being formed by mutually separate inner and outer cylindrical coil elements, respectively, each said element comprising a plurality of coil wire sections of a conductor having an insulation coating and mutually parallely arranged along the periphery of cylindrical shape of said cylindrical element while running from one of both axial end edges of said cylindrical shape to the other relatively in intersecting relationship to said wire sections in the other element, said separate inner and outer coil elements being assembled closely coaxially so as to opposite, in radial direction of the cylindrical shape, each end of said wire sections in one of the elements to each end of the wire sections in the other element at each of said axial ends, said wire sections of each of said elements being twisted into a helical orientation, with the twisting of the wire sections of said element being performed in a direction opposite that of the other element to establish said intersecting relationship, and means for electrically connecting between said radially opposed ends of the wire sections of the respective elements for forming an electrically closed loop of coil in which the wire sections intersecting diagonally the magnetic field, said electric connecting means comprising a fused nugget of said conductor of said wire sections exposed at said axial end edges.

4,463,277

COMPACT HALOGEN-CYCLE INCANDESCENT LAMP, AND LAMP UNIT UTILIZING SUCH LAMP AS A LIGHT SOURCE

Aristide R. DeCaro, Bayside, N.Y., assignor to North American Philips Lighting Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 176,627, Aug. 11, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,352
Int. Cl.³ H01K *1/28, 1/50*
U.S. Cl. 313—25 **12 Claims**

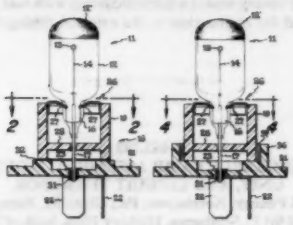


1. An electric lamp unit comprising, in combination;
a sealed housing that has a light-transmitting portion and contains a non-oxidizing gaseous atmosphere at a predetermined pressure, and
a compact halogen-cycle type incandescent lamp that is supported within said housing and has a sealed envelope that contains a controlled amount of a selected halogen and an inert fill gas at a predetermined pressure below about one atmosphere,
the envelope of the halogen-cycle incandescent lamp being composed of a hard glass that is selected from a group of such glasses that have different softening temperatures all of which are such that the envelope will withstand the elevated temperatures required to sustain the halogen cycle, and
the gas pressures within said housing and halogen-cycle lamp envelope being correlated with one another in a manner such that (a) the total gas pressure does not exceed about 1,000 Torr and (b) the gas-pressure relationship establishes a thermal condition within the operating lamp unit which causes the envelope of the halogen-cycle lamp to operate at a temperature which is sufficient to sustain the halogen cycle but is below the softening temperature of the particular hard glass from which the lamp envelope is fabricated.

4,463,278
LAMP UNIT HAVING ACCURATELY POSITIONED FILAMENT

Walter J. Kosmatka, South Euclid, and Frank E. Zalar, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 21, 1982, Ser. No. 380,482
Int. Cl.³ H01J 5/48, 5/50
U.S. Cl. 313—318 7 Claims

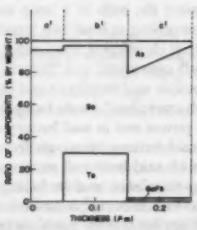


1. A lamp unit comprising a light bulb secured to a base, said light bulb comprising a sealed envelope with a pinch seal enclosing a light source and having lead-in wires extending externally of the envelope, and said base comprising a tubular lamp holder member having an end thereof positioned against a flat surface of a bottom member, said tubular lamp holder member being provided with lamp alignment and support means slidable in the lamp holder member and frictionally engaging the light bulb for alignment with respect to said lamp holder member, said bottom member being provided with openings for receiving said lead-in wires of the light bulb, said light bulb being positioned to extend at least partly into said tubular lamp holder member with its lead-in wires extending into or through said openings, means attaching said lead-in wires to said bottom member, and means attaching said tubular lamp holder member to said bottom member, whereby prior to said attachments said light bulb is longitudinally movable in said base, and said light bulb and tubular lamp holder member are laterally and rotatably movable with respect to said bottom member, thereby permitting accurate alignment of said light source with respect to said bottom member.

4,463,279
DOPED PHOTOCONDUCTIVE FILM COMPRISING SELENIUM AND TELLURIUM

Keiichi Shidara, Tama; Kenkichi Tanioka; Teruo Uchida, both of Tokyo; Chushirou Kusano, Tokorozawa; Yukio Takasaki, Hachioji; Yasuhiko Nonaka, and Eisuke Inoue, both of Mobara, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed May 21, 1982, Ser. No. 380,779
Claims priority, application Japan, May 29, 1981, 56-80914
Int. Cl.³ H01J 29/45, 31/38
U.S. Cl. 313—386 15 Claims

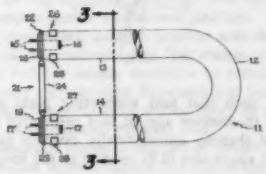


1. A photoconductive film comprising a photoconductive layer which is mainly made of selenium, said layer having a region added with tellurium located in a direction of the thickness of the layer, wherein at least one of said tellurium added region and another region located adjacent in a direction of hole flow to said tellurium added region is doped with at least one member selected from the group consisting of an oxide, a fluoride and elements belonging to one of the groups II, III and VII of the Periodic Table, which are capable of forming negative space charge in selenium, and wherein said at least one member is doped to at least a portion located in the hole flow direction of said tellurium added region when it is doped thereto, and at least a portion of said another region when it is doped thereto, at a concentration in a range of 10 ppm to 1% by weight on an average.

4,463,280
SHAPED DISCHARGE LAMP WITH STARTING AID

Edward E. Hammer, Mayfield Village, and Charles E. Beck, Chesterland, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,499
Int. Cl.³ H01J 17/00, 61/00
U.S. Cl. 313—594 5 Claims



1. A discharge lamp comprising an elongated bulb shaped so that its ends are substantially closer together than if the bulb were straight and containing electrodes respectively near said ends thereof, electrically interconnected bracing straps around the end regions of said bulb, and starting aids comprising conductive means respectively adjacent to said bulb and behind said electrodes and comprising stems respectively extending under and clamped by said bracing straps.

4,463,281
HIGH-PRESSURE ELECTRIC DISCHARGE LAMP WITH ELECTRODE SUPPORT

Walter Triebel, and Heinz Bunke, both of Eichstätt, Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Jul. 30, 1981, Ser. No. 288,408
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029824
Int. Cl.³ H01J 61/073, 61/30, 61/36, 9/18
U.S. Cl. 313—623 12 Claims

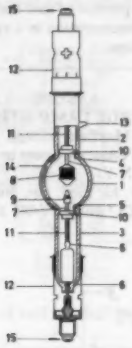
1. In an elongated high-pressure electric discharge lamp having a pair of electrode rods having respective electrodes (8,9) at the ends thereof; a quartz glass envelope (1) containing a rare gas and surrounding the discharge space and the electrodes; and a pair of envelope necks (2,3) respectively coupled to opposite ends of said envelope (1) and located in the direction of the longitudinal axis of the lamp, said envelope necks surrounding respective electrode rods and having at their outer ends a vacuum-tight seal to the respective electrode rod; the improvement comprising the combination of:

a pair of supporting parts (10), each being mounted in a respective envelope neck, each supporting part having a smaller cross section than the envelope neck and being arranged between the respective electrode and electrode seal, said supporting parts each having a substantially

central bore through which an electrode rod is passed so as to surround a respective electrode rod;

each envelope neck (2,3) having a pre-formed narrowing (4,5) at the transition thereof to the envelope (1), each narrowing (4,5) having an inclined inner surface at the side thereof facing away from said discharge space in said envelope (1), which inclined surface forms a valve-seat-like bearing surface for said supporting part (10);

each supporting part (10) having a rounded end facing said discharge space and resting against a respective inclined



surface, such that said supporting parts automatically position themselves against said respective inclined surface and thereby automatically position said electrode rods and electrodes (8,9) relative to the longitudinal axis of the lamp; and

means for securing each supporting part in the direction of the longitudinal axis of the lamp, with said supporting parts located between said discharge space and a respective electrode seal and urging the supporting parts (10) against a respective inclined surface of a respective narrowing.

4,463,282

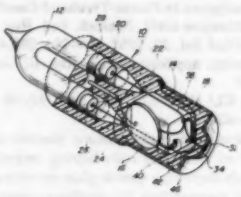
FLASH LAMP

Fredrick W. Eggers, Palos Heights, Ill., assignor to Federal Signal Corporation, Oakbrook, Ill.

Filed May 10, 1982, Ser. No. 376,752

Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*

U.S. Cl. 315—70 **6 Claims**



1. For use in a flash lamp assembly in which there is a direct current supply external of the flash lamp and a timing circuit external of the flash lamp, and the flash lamp relies on the external timing circuit for the timing of the flashes, a flash lamp which comprises:

a flash tube having an anode, a cathode, and a trigger electrode;

a first inlet line and a second inlet line;

a transformer having a primary and a secondary;

a capacitor in series with the primary winding of the transformer;

the capacitor and primary winding being connected across the first inlet line and second inlet line;

said transformer and capacitor circuit coupled to said anode, cathode and trigger electrode;

a multi-contact lamp base;

means connecting said first line to one base contact and said second line to another base contact;

said flash tube, transformer and capacitor circuit and said base all forming a unitary, integral lamp without the need for any timing means within the lamp, with said base being adapted for connection to the external timing circuit.

4,463,283

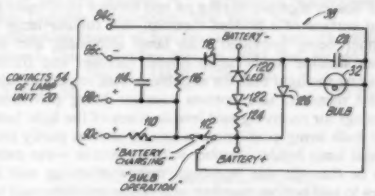
RECHARGEABLE LAMP ASSEMBLY, MOUNTING UNIT, AND CIRCUIT THEREFOR

C. Bradford Penney, Norristown, Pa.; Glenn M. Zabec, Franklin Park, and Sri P. Sridharan, Hickory Hills, both of Ill., assignors to Streamlight, Inc., Norristown, Pa.

Division of Ser. No. 126,967, Mar. 3, 1980, Pat. No. 4,345,304. This application Mar. 26, 1982, Ser. No. 362,169

Int. Cl.³ H05B *39/10, 41/46*

U.S. Cl. 315—87 **3 Claims**



1. A mounting unit for mounting a rechargeable lamp unit thereon for storage and recharging of said lamp unit, wherein said lamp unit includes a first set of electrical contacts of particular configuration connected to circuit elements within said lamp unit, said mounting unit comprising a second set of electrical contacts adapted to mate with said first set of electrical contacts of said lamp unit when said lamp unit is mounted to said mounting unit, said mounting unit including a third set of electrical contacts of said particular configuration electrically connected to said second set of electrical contacts, whereby a recharging unit may be employed having a set of electrical contacts of the same configuration as said second set of electrical contacts to be connected to (a) said third set of electrical contacts to recharge said lamp unit when the latter is mounted to said mounting unit, or to (b) said first set of electrical contacts when it is desired to recharge said lamp unit independent of said mounting unit.

2. A circuit for controlling recharging of a two-terminal battery that energizes the bulb in a lamp and for controlling bulb operation, comprising at least two terminals for receiving a recharging current developed from input power, a switch having at least "bulb operation" and "battery charging" modes and operating to couple said battery to said bulb to energize the latter in said "bulb operation" mode independent of the presence of said input power and in said battery charging mode to decouple one of said battery terminals from a bulb terminal thereby to extinguish said bulb and to couple said battery to said two charging terminals, and including a third terminal which is connected to said decoupled bulb terminal only when said input power is not present for applying battery potential to said bulb to operate the latter when said switch is in said "battery charging" mode.

4,463,284

METHOD AND APPARATUS FOR CONTROLLING LUMINOUS INTENSITY OF FLUORESCENT LAMP OF REPRODUCING APPARATUS

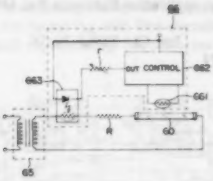
Akihiko Tamura; Katsuhiro Shukuri; Kiyoaki Kawamoto, and Haruo Iwahashi, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,392

Claims priority, application Japan, Jul. 28, 1981, 56-118621; Jul. 28, 1981, 56-118622

Int. Cl.³ H05B *41/36*

U.S. Cl. 315—158 16 Claims



1. In a reproducing apparatus, in combination: a photoconductive photosensitive member; a cold cathode type fluorescent lamp for illuminating said member to produce an effect thereon; and a luminous intensity controlling apparatus for maintaining the luminous intensity of said lamp at some predetermined level comprising: detecting means for detecting the luminous intensity of said lamp and for providing an electric output signal related thereto; reference means for receiving said output signal and for comparing it to a reference signal representative of some predetermined luminous intensity and for providing a reference output signal based on the comparison; and lamp current control means for receiving said reference output signal and for controlling the lamp current of said lamp in accordance therewith to maintain the luminous intensity of said lamp at said predetermined level.

4,463,285

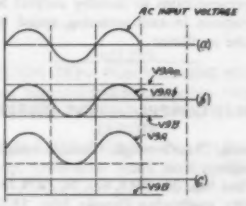
DC BALLASTING MEANS FOR FLUORESCENT LAMPS

Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010

Filed Mar. 8, 1982, Ser. No. 356,089

Int. Cl.³ H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—205 9 Claims



1. A ballasting means for a fluorescent lamp having a first and a second cathode, each cathode having a first and a second input terminal, said ballasting means being adapted to operate from an AC voltage and comprising:

a pair of ballast input terminals adapted to connect with said AC voltage,

a source for providing a unidirectional voltage across a pair of DC output terminals whenever said ballast input terminals are connected with said AC voltage,

a diode means having a first and a second terminal, said second terminal being connected with said first input terminal of said first cathode,

means for connecting one of said pair of DC output terminals to the first terminal of said diode means, and the other one of said pair of DC output terminals to one of the input terminals of said second cathode, and

capacitor means connected between one of said ballast input terminals and the second input terminal of said first cathode,

whereby, if a break occurs in the connection between said first and second terminal of said first cathode, the magnitude of the voltage attained at said first terminal is reduced in comparison with that of the voltage present before said break occurs.

7. A ballasting means for a gas discharge lamp, said lamp having a first and a second cathode, each cathode having a first and a second connection terminal, said ballasting means being adapted to operate from a source of AC voltage and comprising:

a pair of ballast input terminals adapted to connect with said source of AC voltage,

a first series-combination of a first rectifier and a first capacitor, said first series-combination being connected across said pair of input terminals, said first rectifier having its cathode connected with one terminal of said first capacitor at a first junction,

a second series-combination of a second rectifier and a second capacitor, said second series-combination being connected across said pair of input terminals, said second rectifier having its anode connected with one terminal of said second capacitor at a second junction,

first means connecting said first junction with the first terminal of said first cathode, said first means comprising an auxiliary rectifier means operative to permit current to flow in only one direction from said first junction,

second means connecting the second junction with the first terminal of said second cathode, and

auxiliary capacitor means connected in circuit between one of said ballast input terminals and one of the terminals of said first cathode.

4,463,286

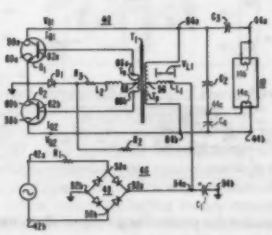
LIGHTWEIGHT ELECTRONIC BALLAST FOR FLUORESCENT LAMPS

James W. H. Justice, Murrysville, Pa., assignor to North American Philips Lighting Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 231,523, Feb. 4, 1981, abandoned. This application Aug. 21, 1981, Ser. No. 294,953

Int. Cl.³ H05B *41/29*

U.S. Cl. 315—219 7 Claims



1. A starting and operating apparatus for a fluorescent lamp having one electrode adapted to be preheated to facilitate lamp starting comprising:

apparatus input terminals adapted to be connected across a source of AC energizing potential, and apparatus output terminals across which the lamp to be operated is adapted to be connected in circuit;

AC to DC conversion means having input terminals and output terminals, said conversion means input terminals connected to said apparatus input terminals and said conversion means operable to convert said AC potential to

predetermined DC potential which is developed across said conversion means output terminals;

transformer means having a primary winding of predetermined inductance and a secondary winding, said transformer means primary winding connected at its mid-point via a choke to one output terminal of said conversion means, tuned circuit capacitor means of predetermined capacitance connected across said transformer means primary winding to form therewith a first resonant tuned circuit when said lamp is connected in circuit but is not operating, a current-limiting capacitor means connected in series with said lamp as connected in circuit, said series-connected lamp and current-limiting capacitor means being connected in parallel with said tuned circuit capacitor means, and said current-limiting capacitor means and said tuned circuit capacitor means forming with said transformer means primary winding a second tuned circuit when said lamp is connected in circuit and is operating;

a pair of transistors connected in push-pull arrangement in circuit between the ends of said transformer means primary winding and the other output terminal of said conversion means, the base electrodes of said transistors being connected across said transformer means secondary winding so that the push-pull connected transistors oscillate at the tuned circuit resonant frequency as determined by the inductance of said transformer means primary winding and the total capacitance of said connected capacitor means, and means for applying a potential from said one output terminal of said conversion means to the midpoint of said transformer means secondary winding to initiate transistor conduction upon energization of said apparatus, and

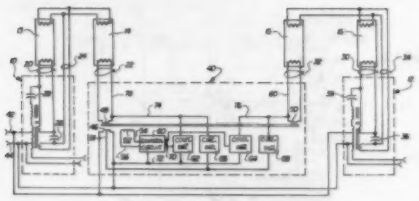
when said lamp is connected to said apparatus output terminals, said preheatable electrode is connected in electrical circuit intermediate one end of said transformer means primary winding and said tuned circuit capacitor means so as to effect electrode preheating.

4,463,287

FOUR LAMP MODULAR LIGHTING CONTROL

Ira J. Pitel, Morristown, N.J., assignor to Cornell-Dubilier Corp., Wayne, N.J.

Filed Oct. 7, 1981, Ser. No. 309,260
Int. Cl.³ H05B *41/392*
U.S. Cl. 315—291 **6 Claims**



1. An apparatus for controlling output illumination level of gas discharge lamps comprising:

a source of AC voltage;

multiple ballast means for providing operating electrical current to said lamps, each said ballast means coupled in series relationship with at least one said gas discharge lamp;

a controlled impedance coupled between an output of each said ballast means and at least one lamp;

means for controlling a period of conduction of each said controlled impedance;

an isolation transformer, having a primary winding coupled between a neutral and a power supplying terminal of each said ballast means, a voltage tap on said primary winding, and a secondary winding coupled to a cathode of said lamps; and

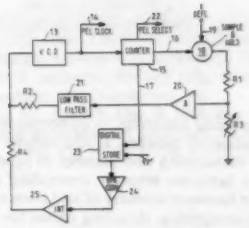
an inductor coupled in parallel relationship with each said controlled impedance providing a current path between said voltage tap and said discharge lamps at least when each said impedance is non-conducting.

4,463,288

CATHODE RAY TUBE DRIVE CIRCUITRY

Ian D. Judd, Eastleigh, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,862
Claims priority, application European Pat. Off., Oct. 31, 1980, 80303881.9
Int. Cl.³ H01J *29/56*
U.S. Cl. 315—371 **5 Claims**



1. Cathode ray tube drive circuitry comprising in combination

deflection generator means,

means for tracing a raster on the screen including a deflection yoke which is arranged to cooperate with said deflection signal generator means so as to cause the electron beam repetitively to trace a line across the screen,

and means for generating pel clock pulses each defining an internal during which the intensity of the electron beam is modulated in accordance with the required image,

characterized in that said cathode ray tube drive circuitry comprises a variable frequency oscillator for producing said pel clock pulses, a digital store containing representations indicative of anticipated variations in scanning speed at certain points of the scanned line, and means for varying the frequency of the oscillator in accordance with the stored representations to thereby correct for anticipated speed variations in said scanning speed by slowing or speeding the oscillator.

4,463,289

WHEEL SLIP CONTROL USING DIFFERENTIAL SIGNAL

John A. I. Young, Peterborough, Canada, assignor to General Electric Company, Erie, Pa.

Filed Sep. 30, 1982, Ser. No. 429,730
Claims priority, application Canada, Mar. 11, 1982, 398159
Int. Cl.³ G06F *15/20*
U.S. Cl. 318—52 **7 Claims**

1. Apparatus for controlling wheel slip in a locomotive driven by d.c. motors comprising

sensor means for sensing the speeds of individual wheels driven by respective motors and providing first signals representing individual wheel speeds,

first comparison means for receiving said first signals and deriving a second signal having a value representing the difference between the highest and the lowest sensed wheel speeds,

means for deriving a third signal having a value that is adjusted in response to changes in the amount of energy provided to said motors,

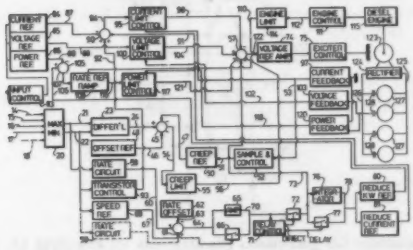
second comparison means for comparing said second and third signals to derive a fourth signal representative of the difference between the values of said second and third signals, and

means to apply said fourth signal to control electrical power to said motors in a manner that reduces power as said second signal increases beyond a value determined by the value of said third signal.

4. Apparatus for controlling wheel slip in a locomotive having d.c. drive motors and a diesel driven generator providing electrical power to said drive motors, comprising

sensor means for sensing the speed of individual wheels driven by respective ones of said motors and providing first signals representing the speed of individual wheels,

a velocity unit for receiving said first signals and providing a second signal representing the difference between said



first signal representing the highest wheel speed and said first signal representing the lowest wheel speed,

sensor means for sensing the current provided to said motors and providing a third signal representing the level of said current,

sample means for periodically sampling said third signal and storing the latest sampled value and the preceding sampled value and providing a fourth signal based on a comparison of the two sampled values of said third signal,

creep reference means receiving said fourth signal and providing as a reference signal a fifth signal based on said fourth signal,

adding means for adding said second signal and said fifth signal and deriving therefrom a sixth signal, and

means responsive to said sixth signal for controlling the generator output to maximize current output during acceleration.

4,463,290

INDUCTION TYPE POSITIONING SYSTEM

Kazuo Asakawa, Kawasaki, and Toshimasa Miyazaki, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 5, 1981, Ser. No. 271,044
Claims priority, application Japan, Jun. 6, 1980, 55-76164
Int. Cl.³ G05B *11/00*
U.S. Cl. 318—135 **23 Claims**

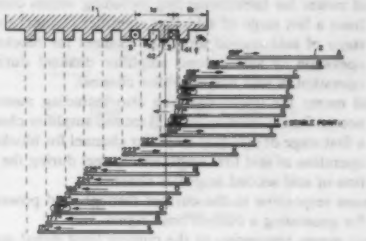
1. An induction type positioning system comprising:

a magnetic yoke including at least one main pole and an auxiliary pole which is magnetically combined with said main pole;

a single phase AC magnetic field generation means for inducing said main pole to generate a higher AC magnetic field, and to generate a lower AC magnetic field than said higher AC magnetic field;

a conductive plate positioned within said higher and lower AC magnetic field such that said plate and yoke move relative to one another; and

means for generating a holding force for stopping or holding the relative movement between said magnetic yoke and said conductive plate, said holding force responsive to a first eddy current induced on said conductive plate by the higher AC magnetic field generated by said main pole at a position where said conductive plate is opposite said auxil-



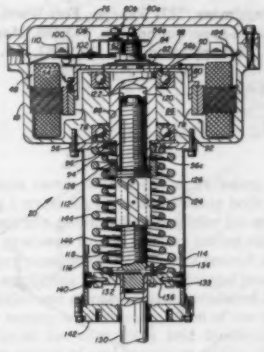
iary pole and the main pole, and a second eddy current induced on said conductive plate by the lower AC magnetic field generated by said auxiliary pole.

4,463,291

AUTOMATIC CONTROL SYSTEM AND VALVE ACTUATOR

Joe D. Usry, Salt Lake City, Utah, assignor to Andale Company, Lansdale, Pa.

Continuation of Ser. No. 108,826, Dec. 31, 1979, abandoned.
This application Jul. 20, 1981, Ser. No. 285,305
Int. Cl.³ H02K *29/02, 7/06*
U.S. Cl. 318—254 **20 Claims**



1. An automatic control system for a motor having at least one stator winding and a rotor comprising:

input circuit means including means for selecting one of a plurality of stator windings and responsive to an input rotor position control signal, a rotor position signal, and a commutating signal that varies with rotation of the motor;

said input circuit means including means responsive to the difference between the input rotor position control signal and the rotor position signal and further responsive to the commutating signal for generating a time varying voltage for each winding of the motor;

each time varying voltage having a time displacement with respect to the voltage of each of the other stator windings of the motor;

a power stage for each winding of the motor responsive to the one of the time varying voltages from said input circuit means, each power stage generating a motor winding voltage for energizing one winding of said motor;

each power stage including a first amplifier channel connecting one winding of said motor to a power supply, and a second amplifier channel for connecting said one winding

of said motor to ground, and means for interconnecting each amplifier channel to alternatively prevent one or the other of said amplifier channels from operating in a conduction mode;

said means for interconnecting including means connected from a last stage of said first amplifier channel to a first stage of said second amplifier channel for blocking the operation of said second amplifier channel during the operation of said first amplifier channel;

said means for interconnecting also including means connected from a last stage of said second amplifier channel to a first stage of said first amplifier channel for blocking the operation of said first amplifier channel during the operation of said second amplifier channel;

means responsive to the current through said power stage for generating a current limit signal; and

limit means responsive to the current limit signal and coupled to said input circuit means to inhibit the generation of the time varying voltages.

4,463,292

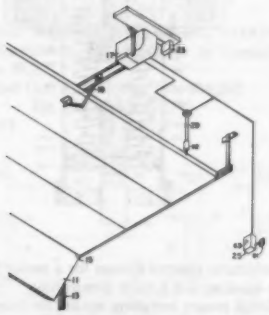
SECURITY TIMER FOR AUTOMATIC GARAGE DOOR OPENER

Robert J. Engelmann, 7271 Vanessa, Fort Worth, Tex. 76112

Continuation-in-part of Ser. No. 243,480, Mar. 13, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,063

Int. Cl.³ H02P *1/04*

U.S. Cl. 318—283 **6 Claims**



1. Security means for automatically causing a powered overhead door to close after it has been open for a selected time interval, comprising:

oscillator and counter means for providing pulses, for counting the pulses, and for providing outputs corresponding to the number of pulses counted;

signal means for causing the oscillator and counter means to begin operation when the door is open;

actuating means, actuated by an output from the oscillator and counter means that occurs after a selected number of pulses has been counted, for causing the door to close; and

variable means for varying the frequency of the oscillator and counter means to selectively vary the time from opening of the door to the closing of the door by the actuating means, the oscillator and counter means being supplied with power only when the door is open.

4,463,293

METHOD AND APPARATUS FOR SHUTTING OFF A POWER SCREWDRIVER

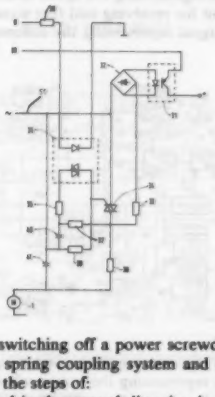
Friedrich Hornung, Stuttgart; Wolfgang Jundt, Ditzingen; Fritz Schädlich, Leinfelden-Echterdingen; Hans-Joachim Vogt, Stuttgart, and Steffen Wünsch, Dettenhausen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,624

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210929

Int. Cl.³ H02P *1/22*; H02H *7/085*

U.S. Cl. 318—284 **14 Claims**



1. Method of switching off a power screwdriver equipped with a motor, a spring coupling system and a screwdriving tool, comprising the steps of:

running the tool in the normal direction in a screwdriving operation;

reversing the direction of rotary force in the motor when a predetermined torque value is exceeded by the torque applied to the screwdriving tool;

after powering the motor for rotary force in the reverse direction for a first predetermined time interval, switching off the supply of power to the motor and allowing the motor to coast, and

after the lapse of a second predetermined time interval, powering the motor for rotary force in the original direction of rotation for a brief third interval time.

10. A power screwdriver equipped for automatic stopping, comprising

a reversible motor having an energizing winding and capable of being reversed by reversing the electrical connections of said winding;

a drive shaft mounted so as to be driven by said motor;

a screwdriver tool;

a spring coupling for coupling said screwdriver tool mechanically to said drive shaft;

a power cord for connecting the power screwdriver to an electrical power line;

a full-wave bridge circuit of electrically controllable semiconductor switches interposed between said power cord and said winding of said motor;

circuit means for controlling said bridge circuit for operating said motor in either direction and assuring that the beginning of operation of said motor in any direction takes place only when the portion of said bridge circuit related to operation of the motor in the other direction is conducting no current; and

control means for causing said control circuits to provide operation of said motor in its normal screwdriving direction from the beginning of a screwdriving operation until a predetermined torque is transmitted by said spring coupling, for thereafter operating said motor to produce rotary force in its reverse direction for a first predetermined period of time, for thereafter removing the applica-

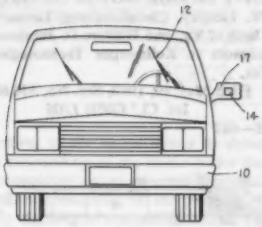
tion of power to said winding of said motor for a second predetermined period of time, for thereafter operating said motor to produce force in its normal direction of operation for a third predetermined period of time, and for switching off power to said motor winding at the end of said third predetermined period of time.

4,463,294

WINDSHIELD WIPER CONTROL APPARATUS

Paul N. Gibson, Rte. 1, Box 239, Saluda, S.C. 29138

Filed Mar. 25, 1983, Ser. No. 478,908
Int. Cl.³ H02P 5/32
U.S. Cl. 318—313 **8 Claims**



1. An apparatus for automatically controlling the operation of a motor for a windshield wiper of a vehicle responsive to the intensity of rain striking said vehicle comprising:

a rain sensor carried on the exterior of said said vehicle;

(i) a housing;

(ii) a plurality of infrared emitters carried on one side of said housing;

(iii) a plurality of infrared sensors carried by said housing and being spaced from said infrared emitters;

(iv) said housing being positioned for allowing rain to pass between said emitters and sensors;

means for supplying a signal of a predetermined frequency to said plurality of infrared emitters causing said emitters to generate infrared signals of a predetermined frequency;

a plurality of control circuit means for energizing said motor at different speeds upon being activated;

means electrically connected to said sensors for measuring the frequency of said infrared signals received by said infrared sensors and activating one of said control circuit means depending on the intensity of the rain passing between said infrared emitters and infrared sensors for controlling the speed of operation of said wipers.

4,463,295

SYNCHRONOUS ELECTRIC CONVERTER MOTOR

Rudolf V. Musil, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

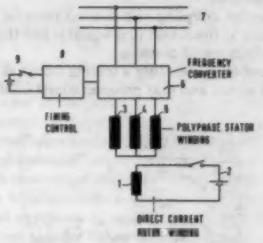
Filed Jun. 25, 1982, Ser. No. 392,138
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3126318
Int. Cl.³ H02P 1/28
U.S. Cl. 318—436 **1 Claim**

1. An electric converter motor of synchronous design, for use as a hoist motor, comprising:

a polyphase stator winding;

a rotor field winding adapted to be coupled to a source of direct current; and

a frequency converter having an input for connection to a power network and a polyphase output coupled to the stator winding, the frequency converter being controllable to supply DC current to two phases of the stator winding when the motor is standing still to maintain a field in the motor during stand-still, the motor remaining standing still while the DC current is supplied to said two phases.

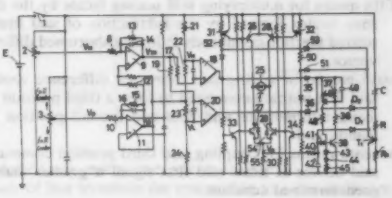


4,463,296

VEHICLE MOTOR DRIVING CIRCUIT

Yoshiharu Tada, and Yuichi Kitano, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,500
Claims priority, application Japan, May 30, 1981, 56-83187
Int. Cl.³ G05F 1/00
U.S. Cl. 318—452 **5 Claims**



1. In a vehicle motor driving circuit including a transistor circuit having a transistor for use in feeding both normal and reverse currents to a motor, a first amplifier for amplifying an output signal produced from a position setting means for setting a stationary position of the motor, a second amplifier for differentially amplifying both an output signal produced from said first amplifier and an output signal produced from a sensing means for sensing a rotational position of the motor, and a calculation circuit for controlling said transistor circuit in response to an output of said second amplifier, the improvement consisting in a control transistor having a power supply switch and which is operated for a specified period of time after said power supply switch is turned on, to turn off said transistor in said transistor circuit and then to keep the motor in an inoperative condition.

4,463,297

CONTROLLER FOR MECHANICALLY ACTUATED DEVICE

R. James Bennett, Laurel, and Robert A. Phillips, Crownsville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1982, Ser. No. 433,051
Int. Cl.³ G05B 13/00
U.S. Cl. 318—561 **43 Claims**

1. Apparatus for controlling the rate of movement of a device positioned by at least one actuator being responsive to each of a sequence of position commands separated by discrete time intervals comprising:

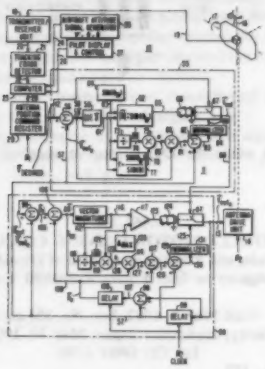
first means for determining the magnitude of the difference between first and second position commands to provide a

first signal indicative of the distance between said first and second position commands,

second means for comparing said first signal with a predetermined constant,

third means for coupling said second position command to said device at times said first signal is less than or equal to said predetermined constant,

fourth means for generating a scaling factor as a function of said first signal and said predetermined constant,



fifth means for multiplying said scaling factor by the difference vector formed by the subtraction of said first and second position commands to form a shortened difference vector,

sixth means for adding said shortened difference vector to said first position command to form a third position command intermediate said first and second position commands, and

seventh means for coupling said third position command to said device at times said first signal is greater than said predetermined constant.

4,463,298

INSTRUMENT FOR KEEPING THE DISTANCE CONSTANT BETWEEN A TOOL AND A WORKPIECE TO BE PROCESSED

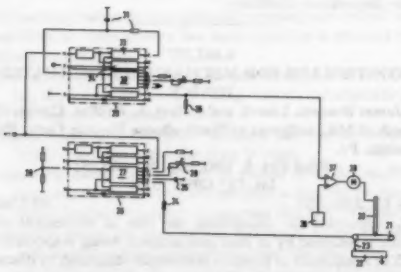
Klaus Halbauer, Dreieich, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,729

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029743

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—662 **2 Claims**



1. In an instrument for maintaining a constant distance between a tool and a workpiece to be processed wherein the instrument has a distance change-detection capacitor formed by a sensing electrode and by the workpiece surface and which is connected to a first phase control system-building block with an incorporated set point-actual value comparing device and tool adjusting device, the improvement being said sensing electrode being connected to a second phase control system-building block which functions as an oscillator, and the output of said second phase control system-building block being connected to the input of the first phase control system-building block whereby a temperature-independent height adjustment is achieved by a single capacitor formed by said electrode and the workpiece.

4,463,299

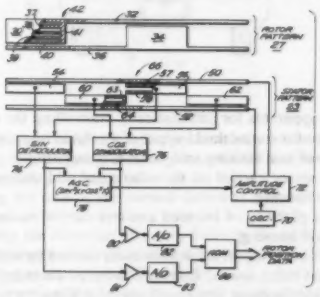
CAPACITIVE SENSOR MOTOR CONTROL SYSTEM

Lawrence W. Langley, Christiansburg; Leonard N. Wedman, Radford, both of Va., and William D. Jacobson, Sierra Vista, Ariz., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed May 10, 1982, Ser. No. 376,656

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—662 **15 Claims**



1. A brushless servo motor comprising:

a stator structure;

a rotor mounted for rotation relative to said stator and dimensioned to provide an air gap between said rotor and said stator;

a set of windings to said motor operational when energized to cause rotation of said rotor relative to said stator; and

a capacitive position transducer located in said air gap including,

a stationary set of interleaved conductive plates insulated from, but attached to, the air gap circumference of said stator, and

a moving set of interleaved conductive plates insulated from, but attached to, the air gap circumference of said rotor.

4,463,300

LINEAR MOTOR DIGITAL SERVO CONTROL

David W. Mayne, San Juan Capistrano, and Alan K. Jennings, Orange, both of Calif., assignors to Printronix, Inc., Irvine, Calif.

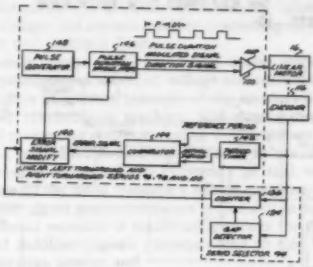
Filed Sep. 17, 1981, Ser. No. 303,082

Int. Cl.³ G05B *11/00*

U.S. Cl. 318—687 **14 Claims**

1. An arrangement for driving a linear motor which undergoes movement along a linear path of motion and then rebounds from a stop member at the end of the linear path of motion, the arrangement comprising the combination of first means responsive to periodic samplings of the speed of the linear motor at predetermined locations along the length of the linear path of motion for energizing the linear motor so as to

attempt to drive the linear motor at a predetermined speed, the first means being rendered inoperative when the linear motor reaches a predetermined location adjacent the end of the linear path of motion, and second means responsive to reaching of the predetermined location adjacent the end of the linear path by the linear motor for applying an energizing signal of predetermined waveform to the linear motor to drive the linear motor through rebounding of the linear motor from the stop member, the energizing signal of predetermined waveform being generated independently of the position of the linear motor following reaching of the predetermined location adjacent the end of the linear path of motion by the linear motor.

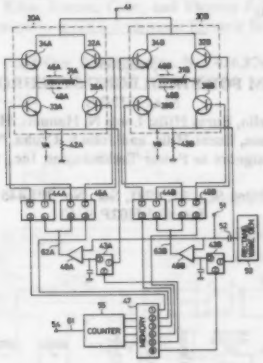


4,463,301

STEP MOTOR DRIVING CIRCUIT

Fujio Moriguchi; Tomio Murayama, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,547
Claims priority, application Japan, Jul. 10, 1981, 56-106903
Int. Cl.³ H02K *29/02*
U.S. Cl. 318—696 **10 Claims**



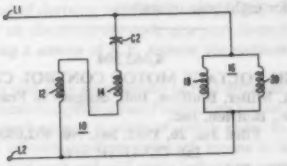
1. A step motor driving circuit for a step motor comprising:
(a) A-phase and B-phase exciting windings, said A-phase and B-phase windings being independent of each other;
(b) first current selection means for selectively applying currents having a first current value, a second current value or zero value to said A-phase windings, said first and second exciting currents being of a predetermined ratio, said first being larger than said second, said first current selection means varying said currents between said values with a gradually changing waveform;
(c) second current selection means for selectively applying currents having said first current value, said second current value or zero value to said B-phase windings, said second current selection means varying said currents between said values with a gradually changing waveform; and
(d) control means for applying control signals to said first and second current selection means in a four state sequence of four successive control signal groups to cause the latter to excite said A-phase and B-phase windings in the following sequence of states: excitation of one of said phase windings with a current of said first current value and the other of said phase windings with a current of zero value; excitation of said one winding with a current of said first current value and the other winding with a current of said second current value; excitation of both phase windings with currents of said first current value; excitation of said one winding with a current of said second current value and excitation of said other winding with a current of said first current value, whereby each successive four state excitation constitutes one step of said step motor.

4,463,302

DUAL POWER, CONSTANT SPEED ELECTRIC MOTOR SYSTEM

Herbert S. Kirschbaum, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1983, Ser. No. 479,775
Int. Cl.³ H02P *3/20*
U.S. Cl. 318—754 **6 Claims**



1. An electric motor system comprising:
a pair of line terminals for connection to a power source;
a first stator winding including two winding sections;
means for connecting said two winding sections of said first stator winding in parallel with each other and between said line terminals for motor operation at a first output power level;
a second stator winding;
a first capacitor connected in series with said second stator winding to form a first circuit branch;
means for connecting said first circuit branch between said line terminals for motor operation at said first output power level;
means for connecting said second stator winding between said line terminals for motor operation at a second output power level;
a second capacitor;
means for connecting said two winding sections of said first stator winding in series with each other and in series with said second capacitor to form a second circuit branch; and
means for connecting said second circuit branch between said line terminals for motor operation at said second output power level, wherein said first and second output power levels occur at substantially the same motor speed.

4,463,303

SIX POLE/EIGHT POLE SINGLE-PHASE MOTOR

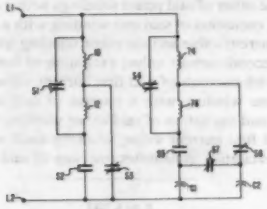
Herbert S. Kirschbaum, Asheville, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 11, 1983, Ser. No. 484,119
Int. Cl.³ H02P *7/48*
U.S. Cl. 318—776 **22 Claims**

1. A single-phase alternating current electric motor comprising:

a main stator winding including two identical coil groups spaced 180 mechanical degrees apart and each having four series connected, non-overlapping coils wherein each end coil in one of said coil groups overlaps one of the end coils of the other coil group;

each coil in said coil groups being wound to span approximately one-seventh of the motor periphery and being



positioned such that the centers of said coils are approximately equally spaced around the motor periphery;

means for connecting said two coil groups to form eight poles for eight-pole motor operation; and

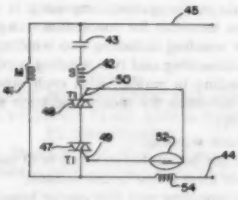
means for connecting said two coil groups to form six poles for six-pole motor operation, wherein one of said coil groups has a reversed polarity with respect to its connection for eight-pole operation.

4,463,304

HIGH VOLTAGE MOTOR CONTROL CIRCUIT

Thomas A. Miller, Bluffton, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed Jul. 26, 1982, Ser. No. 402,083
Int. Cl.³ H02P *1/44*
U.S. Cl. 318—790 **1 Claim**



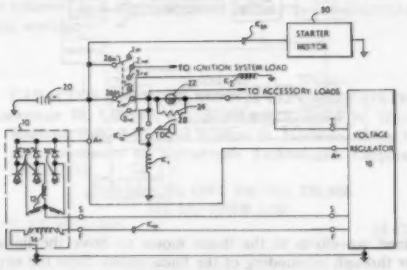
1. A single-phase electric motor connectable to AC power supply lines having a line voltage thereon, comprising a main winding and a start winding connected in parallel and said parallel connection being adapted to be connected to the power supply lines, two substantially identical triacs each of which includes a gate, a first power terminal and a second power terminal, each triac being triggered to conduction by trigger current flow between said gate and said first power terminal, said first and second power terminals of said two triacs being connected in series with said start winding, and said second power terminals of said two triacs being connected together, the inductance of said start winding being at least as great as the line voltage times the turn-on time of said triacs divided by the maximum allowable trigger current of said triacs, a reed switch including normally open contacts and a coil, said gates being connected to opposite sides of said contacts and said triacs being triggered to conduction when said contacts are closed and trigger current flows in a series circuit including said start winding, said first power terminals, said gates and said closed contacts, and said coil being adapted to be connected to one of said supply lines and operating to open and close said contacts.

4,463,305

ALTERNATOR LOAD SHEDDER FOR ENGINE STARTING IMPROVEMENT

Richard J. Wineland, Dearborn, and Robert L. Gault, Garden City, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1981, Ser. No. 331,115
Int. Cl.³ H02J *7/14*; H02P *9/04*
U.S. Cl. 322—10 **8 Claims**



1. A system, within an electrical starting system for an internal combustion engine, for preventing mechanical loading by an engine driven alternator until said engine operates at least in its idle condition for a finite predetermined period of time comprising:

means connected to said engine for sensing the operational condition of said engine and producing an output when said engine maintains its idle condition for a predetermined finite period of time;

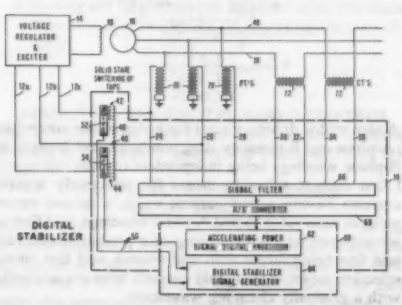
means connected to said sensing means for inhibiting the field current in said alternator in the absence of said output from said sensing means and for allowing normal field current to flow in said alternator when said output is produced.

4,463,306

SYSTEM FOR STABILIZING SYNCHRONOUS MACHINES

F. Paul de Mello, Burnt Hills; Louis N. Hannett, Hudson; David W. Parkinson, Burnt Hills, and John S. Czuba, New York, all of N.Y., assignors to Power Technologies, Inc., Schenectady, N.Y.

Filed Sep. 11, 1981, Ser. No. 301,445
Int. Cl.³ H02P *9/30*
U.S. Cl. 322—25 **17 Claims**



1. System for stabilizing a synchronous machine through excitation control to dampen out the machine oscillations by

direct modulation of the voltage fed back to an automatic voltage regulator, comprising

current and potential transformer means for obtaining a measure of terminal current and voltage of said synchronous machine;

analog to digital conversion means for sampling the values of A.C. voltages and currents on said potential and current transformer means to obtain instantaneous values of sampled voltage and current, and for converting said sampled values into digitized form;

accelerating power signal processing means responsive to said instantaneous values of voltage and current for deriving values of inferred measure of the accelerating power of said synchronous machine, said accelerating power signal processing means including slip frequency deriving means, responsive to said instantaneous values of voltage, to develop values of slip frequency of said voltage in relation to the rated frequency of said machine;

a stabilizer signal generator means responsive to said values of inferred measure of accelerating power for producing digital stabilizer signals corresponding to said values of accelerating power; and

autotransformer means connected between said stabilizer signal generator means and said automatic voltage regulator, including solid state tap switching means responsive to said digital stabilizer signals for selecting the taps on said autotransformer and thereby controlling and modulating its output to said automatic voltage regulator in synchronism with the rate of sampling of said voltages and currents;

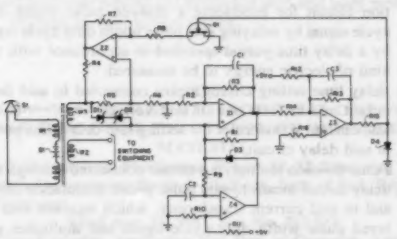
whereby damping of machine oscillations is provided by calculation of the accelerating power through the voltage and current values, and calculation of the rotor slip from the present and past computed values of internal voltage to effect the solid state switching of autotransformer taps to said automatic voltage regulator.

4,463,307

NEGATIVE INDUCTANCE MULTIPLIER CIRCUIT INCLUDING TEMPERATURE COMPENSATION

Frederick J. Kiko, Aurora, Colo.; and Thomas J. Barzen, Addison, Ill., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Oct. 26, 1982, Ser. No. 436,874
Int. Cl.³ H01F *27/42, 40/14*
U.S. Cl. 323—356 **5 Claims**



1. An arrangement for correcting for transformer characteristics comprising in combination:

a transformer including a magnetic core, a primary, a secondary and a tertiary winding thereon;

an impedance simulating network connected to said tertiary winding including feedback circuitry for establishing voltages and currents which affect said transformer as if a negative inductance having a magnitude proportional to the magnetizing inductance of said transformer, and a negative resistance having a magnitude proportional to the resistance of said tertiary winding; and

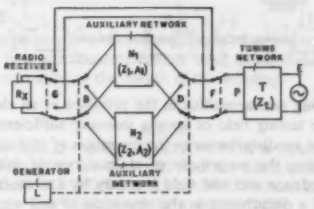
self adjusting positive resistance means, is series with said negative inductance, automatically adjustable to a magnitude to effectively cancel the negative resistance equivalent to the degree of increase in resistance of said tertiary winding.

4,463,308

R.F. IMPEDANCE DETERMINATION

Michael J. Underhill, Horsham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 14, 1981, Ser. No. 263,452
Claims priority, application United Kingdom, May 20, 1980, 8016575; Apr. 13, 1981, 8111625
Int. Cl.³ G01R *27/00*
U.S. Cl. 324—57 R **12 Claims**



1. A method of deriving information of the R.F. impedance presented by an electrical network at a port thereof, the network including a source of R.F. signals; the method comprising:

coupling to said port successively in two different states, an arrangement comprising radio indicating means and auxiliary network means, in each of which states an auxiliary network of said auxiliary network means is in cascade between said port and said radio indicating means, and in which states the impedance presented by the arrangement at said port has different first and second values, respectively, and the gain provided between said port and said audio indicating means by said cascaded auxiliary network has different first and second values, respectively, and

indicating, with said radio indicating means, any difference between the respective values in the two states of at least one of the two parameters, amplitude and phase, respectively, of the signal supplied to said radio indicating means relative to a signal of reference amplitude and phase supplied to said arrangement by the source;

wherein the respective differences between the values of said parameters being zero on respective loci, the loci being defined in the complex impedance plane for said R.F. impedance of the network by preselecting the four quantities respectively constituted by said first and second values of impedance and gain.

4,463,309

METHOD AND DEVICE FOR DETERMINING THE THRESHOLD OF RESISTANCE OF AN ELECTRIC OR ELECTROMAGNETIC EQUIPMENT TO AN EXTERNAL ELECTROMAGNETIC AGGRESSION

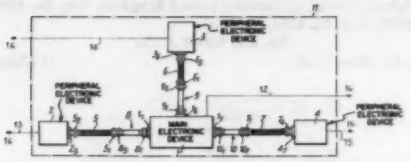
Michel H. Crochet, Verneuil, and Jean-Claude L. Riaudet, Mantes-la-Jolie, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France

Filed Sep. 24, 1982, Ser. No. 422,725
Claims priority, application France, Sep. 29, 1981, 81 18306
Int. Cl.³ G01R *27/00*
U.S. Cl. 324—57 R **4 Claims**

1. A method for determining the threshold of resistance to disturbance by an external electromagnetic field, of an electric or electronic apparatus comprising at least two units interconnected by electrical connection means comprising an external

shield and at least one inner conductor, said method comprising the steps of:

inserting into said connection means a passive injection element having a known relatively low transfer impedance, said element comprising an external casing electrically connected at its ends to the external shield of said connection means, and at least one inner conductor forming a conductive path with each corresponding conductor in said connection means;



operating said apparatus in the presence of an electromagnetic testing field of known intensity sufficiently low to cause no disturbance in the operation of said apparatus;

increasing the magnitude of at least one of said transfer impedance and said field intensity by known increments until a disturbance in the operation of said equipment is observed; and

determining said threshold from the magnitudes of said transfer impedence and said field intensity when said disturbance is first detected.

4,463,310

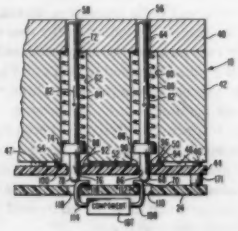
APPARATUS FOR DETECTING THE PRESENCE OF COMPONENTS ON A PRINTED CIRCUIT BOARD

George J. Whitley, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 167,472, Jul. 11, 1980, abandoned. This application Apr. 12, 1983, Ser. No. 484,258

Int. Cl.³ G01R *31/02, 31/08, 31/28*

U.S. Cl. 324—73 PC **9 Claims**



1. Apparatus for detecting the possible absence of any one of a plurality of components of a printed circuit board, the components, when present, each having at least one lead passing through a corresponding aperture in the board, said apparatus comprising:

a support structure;

means for aligning said board and said corresponding aperture relative to said support structure;

means secured to the support structure aligned with said at least one lead of each component by said means for aligning for sensing the presence and absence of any of said at least one aligned lead corresponding to said aligned aperture; and

indicating means coupled to said means for sensing for providing an indication of the absence of one or more of said components.

4,463,311

ELECTRONIC ELECTRIC-ENERGY METER

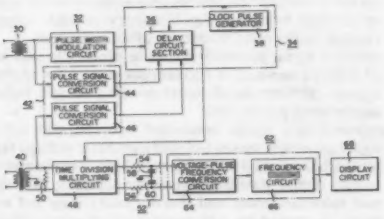
Shunichi Kobayashi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 27, 1981, Ser. No. 267,604

Claims priority, application Japan, May 29, 1980, 55-71723; Jun. 6, 1980, 55-76387; Jul. 25, 1980, 55-105228[U]

Int. Cl.³ G01R *21/06*

U.S. Cl. 324—142 **8 Claims**



1. An electronic electric-energy meter for measuring a kind of electric energy carried on power lines, said meter comprising:

a. a voltage transformer connected to said power lines for producing a voltage signal proportional to a load voltage on said power lines;

b. a current transformer connected to said power lines for producing a current signal proportional to a load current on said power lines;

c. a pulse width modulation circuit connected to said voltage transformer for forming a pulse width duty cycle signal by performing a pulse width modulation based on said voltage signal;

d. delay circuit means connected to said pulse width modulation circuit for producing a delayed pulse width duty cycle signal by delaying said pulse width duty cycle signal by a delay time period specified in accordance with said kind of electric energy to be measured;

e. delay time setting circuit means connected to said delay circuit and at least one of said voltage transformer and said current transformer for setting said delay time period in said delay circuit;

f. a time division multiplying circuit connected through said delay circuit means to said pulse width modulation circuit and to said current transformer, which receives said delayed pulse width duty cycle signal and multiplies said current signal and said delayed pulse width duty cycle signal to obtain an electric power signal proportional to the electric power on said power lines corresponding to said kind of energy;

g. an integration circuit connected to said time division multiplying circuit for producing an electric energy signal proportional to said kind of electric energy by integrating said electric power signal;

h. a processing circuit connected to said integration circuit for converting said electric energy signal to a display signal; and

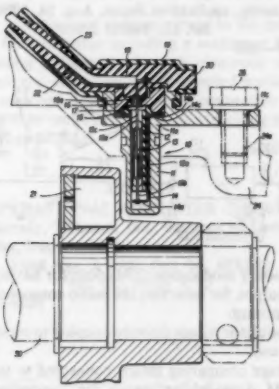
i. a display circuit connected to said processing circuit for displaying a measure of said kind of electric energy in accordance with said display signal.

4,463,312

SPEED SENSOR DEVICE

Yukihisa Oda, Toyota; Naoji Sakakibara, and Hiroyuki Amano, both of Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 12, 1982, Ser. No. 367,388
Claims priority, application Japan, Apr. 13, 1981, 56-055249
Int. Cl.³ G01P 3/48, 3/54
U.S. Cl. 324—174 4 Claims



1. A speed sensor device comprising:
permanent magnet means positioned on a rotational shaft;
a reed switch operably opened and closed in response to the rotational displacement of said pemanent magnet means;
an elastic member protecting the periphery of said reed switch;
a body member formed of an electrically conductive material;
said reed switch being positioned in said body member through said elastic member;
a supporter being in the form of a thin plate and being formed of an electrically conductive material;
said reed switch having a terminal contacted with one end of said supporter; and
projection means formed on the other end of said supporter;
said supporter pushed and contacted with said body member through said projection means.

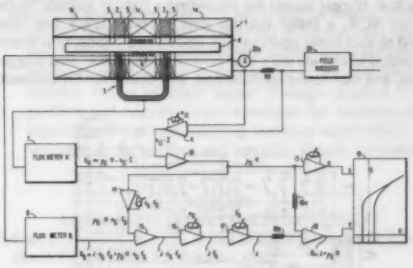
4,463,313

FIELD COIL FOR USE WITH POTENTIAL COIL FOR MEASURING INNER FIELD INTENSITY OF MAGNETIC MATERIAL

Erich Steingroever, Flensburger Strasse 33, 53 Bonn, and Dietrich Steingroever, Bergisch-Gladbach, both of Fed. Rep. of Germany

Filed Aug. 18, 1981, Ser. No. 293,923
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032717
Int. Cl.³ G01N 27/72; G01R 33/12, 33/14
U.S. Cl. 324—243 5 Claims

1. Field coil for use with a potential coil for the measurement of the inner field intensity H of magnetic materials, said potential coil having a medial portion disposed exteriorly of the field coil winding and a pair of terminal portions extending generally radially through said winding into the interior of the field coil at two axially spaced locations:
the turn density of the field coil winding being substantially uniform along most of the length thereof;
an axially extending space which is free of any winding being provided at said two locations to accommodate the passage through the winding of said portions of the potential coil;



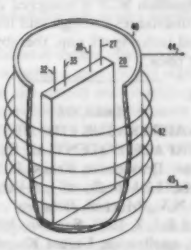
the turn density of a short axial length of said winding adjacent said winding-free spaces being greater than that of the remainder of the length of the winding.

4,463,314

EARTH FIELD COMPENSATION FOR A MAGNETIC DETECTOR BY IMPARTING A PERMANENT MAGNETIZATION TO A MAGNETIC MATERIAL CONTIGUOUS THE DETECTOR

James H. Wilson, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 28, 1980, Ser. No. 172,791
Int. Cl.³ G01R 33/02; G01C 17/38
U.S. Cl. 324—244 8 Claims



1. Magnetic detector compensation apparatus comprising:
(A) a magnetic detector for stationary use at a location and being subject to the influence of the earth's magnetic field;
(B) a magnetic material contiguous said detector;
(C) circuit means for generating an electrical signal to impart a controlled permanent magnetization to said material of a value to substantially cancel the effect of said earth's magnetic field at said detector location and for thereafter removing said electrical signal.

4,463,315

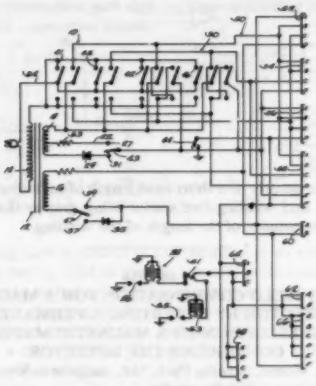
CD POWER PACK TESTER

John M. Kutzler, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 12, 1982, Ser. No. 367,569
Int. Cl.³ F02P 17/00
U.S. Cl. 324—382 11 Claims

1. A CD power pack tester adapted for connection to an AC line and to a CD power pack, the CD power pack including a rectifier circuit connected to a charge capacitor normally charged by an engine charge coil, and an ignition SCR which, upon application of a trigger voltage, is rendered conductive and allows the charge capacitor to discharge through an engine ignition coil to effect firing of an engine spark gap, said tester comprising a power transformer including a primary

winding, and a secondary winding having an output for simulating the voltage of an engine charge coil to charge the charge capacitor, trigger means for providing a trigger voltage to the ignition SCR, a tester ignition coil, a tester spark gap connected to said tester ignition coil, and switch connection means connected in circuit with said power transformer, said trigger means, and said tester ignition coil, and operative for connecting said primary winding to the AC line and said secondary charging winding to the recitifier circuit to charge the charge capacitor, and for connecting said trigger means to the ignition SCR so that the ignition SCR is rendered conductive and the charge capacitor discharges through said tester ignition coil to effect firing of said tester spark gap, thereby testing operation of the CD power pack.



4,463,316

METHOD AND APPARATUS FOR DETERMINING THE DYNAMIC SURFACE POTENTIAL OF A SOLUTION

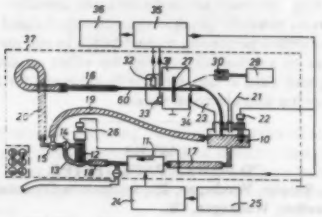
Joseph L. Meseens, Brasschaat; Frans J. Villé, Edegem, and Roland F. Beels, Linkebeek, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Jul. 7, 1982, Ser. No. 395,914

Claims priority, application United Kingdom, Jul. 10, 1981, 8121366

Int. Cl.³ G01N *27/02*

U.S. Cl. 324—447 **10 Claims**



6. Apparatus for determining the dynamic surface potential of a solution, comprising means for producing a steady stream of said solution, said stream having a free surface, an electrode mounted for rotation in an operative position adjacent said free surface at a locus along such stream for determining the difference between the surface potential of the solution at said locus and the surface potential of said electrode, said electrode having at least one electrically conductive surface portion on its periphery, and means for rotating said electrode to cause said surface portion to move repeatedly along a path across said stream, to thereby generate, for the determination of said potential difference, a plurality of potential difference signals.

4,463,317

FM DEMODULATOR WITH REGULATION OF THE OUTPUT D.C. COMPONENT

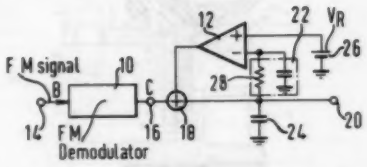
Hiromi Kusakabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 12, 1981, Ser. No. 292,264

Claims priority, application Japan, Aug. 14, 1980, 55-112075

Int. Cl.³ H03D *3/00*

U.S. Cl. 329—103 **6 Claims**



6. A frequency modulation (FM) detector having a constant D.C. level output, for detecting the audio component of an FM signal, comprising:

FM demodulator means directly coupled to receive said FM signal, and

D.C. voltage comparing means connected to the output of said FM demodulator means for comparing the D.C. output level of said FM demodulator means with a reference signal level to control the D.C. output level of said FM demodulator means.

4,463,318

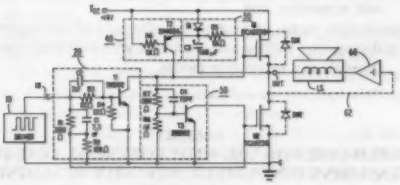
POWER AMPLIFIER CIRCUIT EMPLOYING FIELD-EFFECT POWER TRANSISTORS

Leonard A. Kaplan, Fords, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1982, Ser. No. 412,900

Int. Cl.³ H03F *3/217*, *3/26*

U.S. Cl. 330—251 **8 Claims**



1. Amplifying apparatus comprising:

first and second terminals for receiving operating potential therebetween;

input and output terminals for receiving and supplying respective time-varying signals;

first and second field-effect transistors of like channel conductivity, each having a conductive channel between its drain and source electrodes and each having a gate electrode;

means for coupling the drain and source electrodes of said first transistor to said first and output terminals, respectively;

means for coupling the drain and source electrodes of said second transistor to said output and second terminals, respectively;

means for applying the time-varying signals received at said input terminal to the respective gate electrodes of said first and second transistors including means for inverting the

sense of the time-varying signal applied to the gate electrode of one of said first and second transistors with respect to the sense of the time-varying signal applied to the gate electrode of the other of said first and second transistors;

biasing means responsive to the voltages at the drain and source electrodes of said first transistor for developing a substantially direct current biasing voltage with respect to the voltage at the source electrode of said first transistor; and

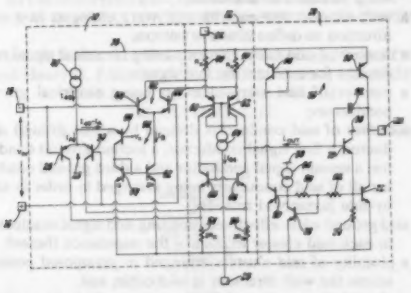
means for applying said biasing voltage to the gate electrode of said first transistor including a resistance for coupling said biasing voltage to the gate electrode of said first transistor and switching means coupled across said resistance for completing a conductive connection thereacross responsive to said biasing voltage exceeding the potential at said first terminal.

4,463,319

OPERATIONAL AMPLIFIER CIRCUIT

Mark B. Kearney, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 2, 1982, Ser. No. 404,580
Int. Cl.³ H03F 3/45
U.S. Cl. 330—258 **2 Claims**



1. An operational amplifier comprising, in combination:

positive and negative voltage supply terminals;

positive and negative input terminals for receiving input signal voltages to the operational amplifier;

an NPN differential amplifier including a pair of NPN transistors having emitter electrodes coupled together and to the negative supply terminal, base electrodes each coupled to a respective one of the positive and negative input terminals and collector electrodes, the NPN differential amplifier providing an output signal between its collector electrodes in accord with the relative values of input signal voltages applied to the positive and negative input terminals over a range including common mode signal voltages substantially equal to the voltage at the positive supply terminal;

a PNP differential amplifier including a pair of PNP transistors having emitter electrodes coupled together and to the positive supply terminal, base electrodes each coupled to a respective one of the positive and negative input terminals and collector electrodes, the PNP differential amplifier providing an output signal between its collector electrodes in accord with the relative values of input signal voltages applied to the positive and negative input terminals over a range including common mode input signal voltages substantially equal to the voltage at the negative supply terminal;

means responsive to input signal voltages at the input terminals for enabling the NPN transistor differential amplifier for operation with high common mode input signal voltages and to enable the PNP transistor differential amplifier for operation with low common mode input signal voltages; and

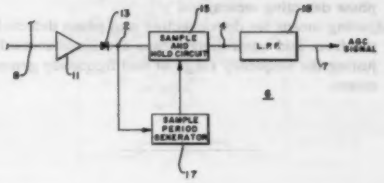
an output translation stage for providing an output signal in accord with the voltage across the collector electrodes of the enabled differential amplifier, whereby the operational amplifier provides an output signal in accord with the relative values of input signal voltages applied to the positive and negative input terminals for common mode input signal voltages ranging between substantially the voltages at the positive and negative supply terminals.

4,463,320

AUTOMATIC GAIN CONTROL CIRCUIT

Sylvan L. Dawson, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 6, 1982, Ser. No. 395,222
Int. Cl.³ H03G 3/30
U.S. Cl. 330—279 **15 Claims**



1. In a radio receiver, an amplifier stage comprising:

a variable gain amplification means having an input and an output;

automatic gain control means operatively connected to the output and producing a gain control signal as a function of a first signal at the output and providing the gain control signal to the variable gain amplification means; and

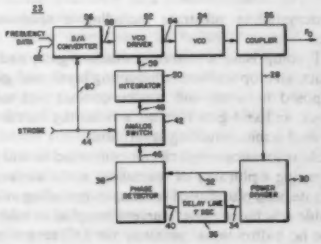
the automatic gain control means includes a detector means for converting the first signal into a detected signal, a sampling circuit means for sampling of the detected signal at a variable sampling rate, low pass filter means for filtering the sample signal to obtain thereby the gain control signal, and sample period generator means for generating the sample period for the sampling circuit means from the detected signal.

4,463,321

DELAY LINE CONTROLLED FREQUENCY SYNTHESIZER

Jimmy M. Horner, Garland, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Dec. 28, 1981, Ser. No. 335,148
Int. Cl.³ H03L 7/16, 7/24
U.S. Cl. 331—1 R **17 Claims**



1. A frequency synthesizer comprising:

frequency generating means for generating an output signal at the synthesized frequency;

dividing means for dividing the output signal into a first and second divided signal, said first divided signal in phase with said second divided signal;

delay means for delaying said first divided signal to provide a delayed signal;

phase detecting means for detecting the phase difference between said second divided signal and said delayed signal, whereby a phase detected output is generated;

controlling means for receiving the phase detected output and converting the phase detected output into a control signal, said control signal controlling said frequency generating means, wherein the frequency of said frequency generating means is adjusted until a predetermined phase difference between said delayed signal and said second divided output is achieved thereby providing an output frequency that is phase locked to said delay means, said predetermined phase difference determined by the amount of delay in said delay means and the characteristics of said phase detecting means; and

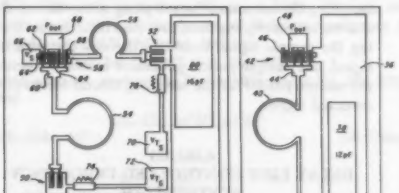
adjusting means for disconnecting said phase detected output from said controlling means and simultaneously adjusting the frequency range of said frequency generating means.

4,463,322

SELF-BIASING FOR FET-DRIVEN MICROWAVE VCOS

Bentley N. Scott, Richardson, and Gailon E. Brehm, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 14, 1981, Ser. No. 292,769
Int. Cl.³ H03B 5/00; H01L 27/04
U.S. Cl. 331—117 D **8 Claims**



1. An integrated voltage-controlled oscillator (VCO), comparising:

a monocrystalline substrate including a semiconducting layer;

an FET comprising a source contact, a gate, and a drain contact, all atop said semiconducting layer, said gate being interposed between said source contact and said drain contact, and said gate forming a Schottky barrier contact with said semiconducting layer; and

a variable-resonance tuned circuit connected to said gate and comprising a plurality of reactances at the surface of said substrate, said plurality of reactances including at least one variable reactance direct current coupled to said gate;

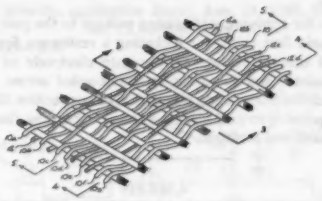
wherein no bidirectional pathway for DC return exists between said gate and said source nor between said gate and said drain.

4,463,323

WOVEN LOW IMPEDANCE ELECTRICAL TRANSMISSION CABLE AND METHOD

Douglas E. Piper, Greenville, S.C., assignor to Woven Electronics Corporation, Greenville, S.C.

Filed Aug. 23, 1982, Ser. No. 410,580
Int. Cl.³ H01P 3/00
U.S. Cl. 333—1 **13 Claims**



1. A woven electrical transmission cable having a low impedance characteristic for transmitting high frequency signals comprising:

a plurality of warp elements extending longitudinally in a warp direction in said cable;

a weft element woven with said warp elements in a weft direction to define a weave pattern;

a number of said warp elements being electrical signal conductors for transmitting said signals;

a number of said warp elements being electrical ground conductors;

a cluster of said conductors defined by a first ground conductor, a first signal conductor, a second ground conductor, a second signal conductor and a third ground conductor all of said conductors being arranged in order in side-by-side juxtaposed relation;

said ground wires effectively isolating said signal conductors in each said cluster to control the impedance thereof;

a plurality of said clusters arranged in juxtaposed position across the weft direction in said cable; and

each said cluster adapted for receiving a single input signal which is split between said first and second signal conductors and output as a single signal from said cluster.

4,463,324

MINIATURE COAXIAL LINE TO WAVEGUIDE TRANSITION

John C. Rolfs, Clearwater, Fla., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 3, 1982, Ser. No. 384,828
Int. Cl.³ H01P 5/103
U.S. Cl. 333—26 **6 Claims**

1. A miniature coaxial line to waveguide transition for frequencies beyond 40 GHz operable over a bandwidth having a center frequency therein, comprising:

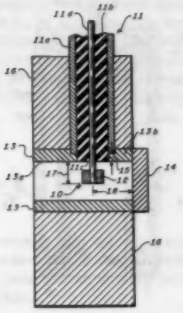
(a) a waveguide having a first end, a second end, a central axis, a wall, an inner surface, and an aperture in said wall;

(b) a waveguide coupling flange, having an aperture therein and a coupling end, affixed to said waveguide so that said coupling end is adjacent to said first end and so that said aperture in said flange is aligned with said aperture in said wall of said waveguide;

(c) a miniature coaxial line, having an outer conductor, a dielectric, and a center conductor projecting from one end, disposed in said aperture in said flange so that said outer conductor is in electrical contact with said flange and so that said projecting center conductor extends continuously through said aperture in said wall into said waveguide substantially perpendicular to said inner surface of said waveguide at said aperture in said wall; and

(d) a shorting plate, disposed at said second end of said

waveguide substantially perpendicular to said central axis of said waveguide such that said projecting center con-



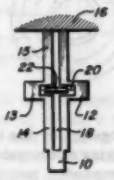
ductor extends into said waveguide between said plate and said coupling end of said waveguide coupling flange.

4,463,325

STUB-SUPPORTED COAXIAL POWER DIVIDER HAVING DISSIPATION RESISTOR BURIED IN CENTER CONDUCTOR

Gordon P. Riblet, 116 Westgate Rd., Wellesley, Mass. 02181, and Henry G. Riblet, 100 W. Cliff Rd., Weston, Mass. 02193

Filed Aug. 17, 1982, Ser. No. 408,902
Int. Cl.³ H01P 5/12
U.S. Cl. 333—127 **8 Claims**



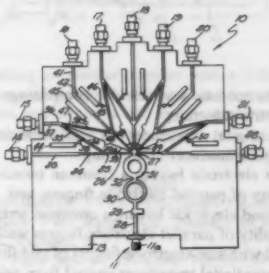
1. A microwave divider network comprising;
means defining an input port having an associated input port center conductor,
means defining two output ports each also having associated respective center conductors,
a transformer conductor connecting the input port center conductor to the two output port center conductors,
an outer conductor,
a stub conductor which extends from the junction of the transformer and output center conductors to the outer conductor,
said stub conductor and transformer conductor being linearly contiguous and having an elongated slot extending therebetween defined by slot side walls, one slot side wall adjacent one output port center conductor and the other slot side wall adjacent the other output port center conductor,
a resistor having a pair of terminals,
means conductively connecting one resistor terminal to one slot side wall,
and means conductively connecting the other resistor terminal to the other slot side wall,
said slot having a depth greater than the height of the resistor so that the resistor does not extend out of the slot so as to thereby contribute very little additional insertion loss.

4,463,326

PLANAR N-WAY COMBINER/DIVIDER FOR MICROWAVE CIRCUITS

Harvey K. Hom, Santa Monica, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 220,294, Dec. 29, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,686
Int. Cl.³ H01P 5/12
U.S. Cl. 333—128 **9 Claims**

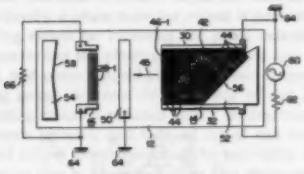


1. A radio frequency combiner/divider device comprising:
a common port and a plurality of branch ports, said device being operative as a power combiner for discrete sources distributed among said branch ports to provide higher power at said common port and said device providing division among said branch ports of power applied to said common port when said device is employed as a divider;
first means comprising a path having a three-quarter wavelength transmission line segment from each port of a first fraction of said branch ports to a corresponding one of a like number of first common points within said device;
second means comprising a quarter wavelength transmission line segment from each port of a second fraction of said branch ports to a corresponding one of a like number of second common points within said device;
third means comprising a plurality of pairs of branch transmission line segments each of one-half wavelength, the lines of one of said branch line pairs being connected at one end from a corresponding one of said second common points and the other ends of each of said branch lines being connected discretely to a predetermined one of said first common points;
fourth means comprising an isolation resistor connected between an electrical ground within said device and the midpoint of each of said third means branch transmission line segments, the number of said resistors thereby being equal to the number of said branch ports;
fifth means comprising a plurality of quarter wavelength transmission line segments, one corresponding and connected between each of said first common points and a third common point, said wavelength corresponding to a predetermined microwave frequency region of operation of said combiner/divider; and
sixth means connecting said third common point to said common port.

4,463,327
SURFACE ACOUSTIC WAVE DEVICE

Hitoshi Suzuki, Yokohama, Japan, and Toshikazu Kodama, Stanford, Calif., assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 5, 1982, Ser. No. 405,435
Claims priority, application Japan, Sep. 9, 1981, 56-141054
Int. Cl.³ H03H 9/25, 9/64
U.S. Cl. 333—194 7 Claims



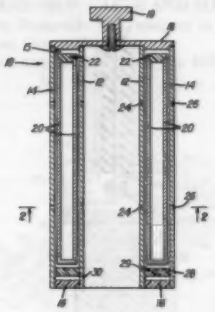
1. A surface acoustic wave device comprising:
a piezoelectric substrate;
a first interdigital transducer on said substrate, said first interdigital transducer comprising:
(i) a first electrode having a common terminal joining a plurality of parallel electrode fingers; and
(ii) a second electrode having a common terminal joining a plurality of parallel electrode fingers uniformly overlapped with said electrode fingers of said first electrode;
a second interdigital transducer spaced from said first transducer on said substrate in a direction of propagation, said second transducer comprising:
(i) a first electrode having a plurality of parallel electrode fingers including a first end finger nearest said first transducer; and
(ii) a second electrode having a plurality of parallel electrode fingers interdigitally overlapped with said electrode fingers of said first electrode, including a second end finger nearest said first transducer, the pattern of overlapping forming a main lobe and a plurallity of side lobes aligned at an angle to said electrode fingers and to the direction of propagation, one of said end fingers being a longer one; and
ground means for connecting to ground the one of said electrodes which includes the longer one of said first and second end fingers.

4,463,328
CAPACITIVELY SHORTENED COAXIAL RESONATORS FOR NUCLEAR MAGNETIC RESONANCE SIGNAL RECEPTION

F. David Doty, Columbia, S.C., assignor to University of South Carolina, Columbia, S.C.

Filed May 17, 1982, Ser. No. 379,116
Int. Cl.³ H01P 7/04; G01R 33/08
U.S. Cl. 333—222 10 Claims

1. A capacitively shortened coaxial resonator for inducing transverse magnetization in an ensemble of nuclear spins, said resonator comprising open-ended inner and outer concentrically arranged metal cylinders which define therebetween a sample region for containing said ensemble of nuclear spins, wherein the ratio of the outer diameter of the inner cylinder to the inner diameter of the outer cylinder is between about 0.5 and 0.8, removable annular metallic cap means for closing one end of the inner and outer cylinder and providing an electrical short circuit therebetween, and at least one ring-like capacitor means connected across the inner and outer cylinders at the other end of the cylinders for resonating with the inductance

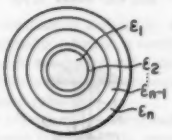


of the coaxial conductor formed by the shorted-together cylinders.

4,463,329
DIELECTRIC WAVEGUIDE

Hirosuke Suzuki, Ohta-Ku, Tokyo, Japan (105)

Continuation of Ser. No. 933,848, Aug. 15, 1978, abandoned.
This application Jan. 15, 1982, Ser. No. 339,631
Int. Cl.³ H01P 3/00
U.S. Cl. 333—239 21 Claims

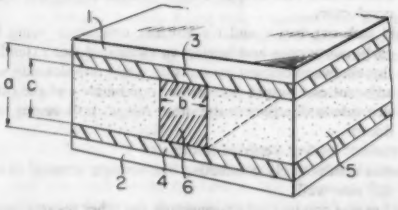


4. A dielectric waveguide for the transmission of electromagnetic waves comprising an elongated shaped article having one or more layers of expanded, porous polytetrafluoroethylene extending radially outwardly from the center of said waveguide.

4,463,330
DIELECTRIC WAVEGUIDE

Tsukasa Yoneyama, Sendai, Japan, assignor to Seki & Company, Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,634
Claims priority, application Japan, Jun. 9, 1982, 57-99822
Int. Cl.³ H01P 3/16
U.S. Cl. 333—239 4 Claims



1. A dielectric waveguide comprising two flat conductive plates arranged in parallel with each other, a dielectric medium between said two conductive plates, a dielectric strip disposed

in said dielectric medium, the dielectric constant of which dielectric strip is larger than that of said dielectric medium, and dielectric layers disposed between the respective conductive plates and said dielectric medium and dielectric strip, specific dielectric constant ϵ_{r1} of said dielectric layers with respect to said dielectric medium, the space a between said two conductive plates, the thickness c of said dielectric medium and the wavelength λ_0 of an electromagnetic wave in said dielectric medium being selected so that the following inequality is satisfied:

$$\tan\left(\frac{\pi c}{\lambda_0}\right) < \sqrt{\epsilon_{r1}} \cot\left(\sqrt{\epsilon_{r1}}\,\pi\frac{a-c}{\lambda_0}\right)$$

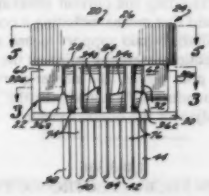
whereby the electromagnetic wave is transmitted through the dielectric waveguide with the electric field of the electromagnetic wave being polarized so as to be primarily parallel with said conductive plates.

4,463,331

ELECTROMAGNETIC RELAY

Max Hurter, Riverside, Calif., assignor to Babcock Electro-Mechanical, Inc., Calif.

Filed May 10, 1982, Ser. No. 376,491
Int. Cl.³ H01H 50/04
U.S. Cl. 335—202 **13 Claims**



1. An electromagnetic relay comprising, in combination,
means forming a housing having a wall,
an armature and at least a pair of electrical contacts for operation thereby within said housing,
a terminal pin for each of said electrical contacts extending through and anchored within said wall to extend externally of said housing,
an electromagnetic motor comprising a winding and a core member for operation of said armature
a carrier having means engaging said core member for supporting said electromagnetic motor and formed with a predetermined number of through openings, and
terminal pins in circuit with said electromagnetic motor and extending through some of said through openings in said carrier,
said carrier being in spaced relation to said wall to position said motor therebetween, and receiving in the other of said openings the terminal pins for said electrical contacts.

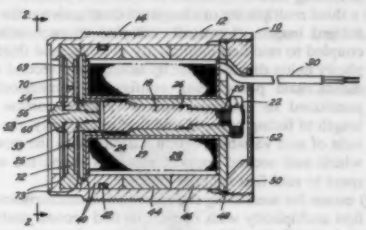
4,463,332

ADJUSTABLE, RECTILINEAR MOTION PROPORTIONAL SOLENOID

William F. Everett, Goshen, Ind., assignor to South Bend Controls, Inc., South Bend, Ind.

Filed Feb. 23, 1983, Ser. No. 468,934
Int. Cl.³ H01F 7/08
U.S. Cl. 335—258 **25 Claims**

1. A rectilinear motion proportional solenoid comprising a housing having therein a movable armature assembly of magnetic material, substantially linear spring means for acting on said armature assembly, a holding means for supporting said armature assembly and said spring means, an electromagnetic coil and an annular permanent magnet for producing a magnetic field, a normally fixed, axially movable trunk-polepiece of magnetic material for acting on said armature assembly, and an adjustment means for changing the position of said trunk-polepiece relative to said armature assembly, said holding



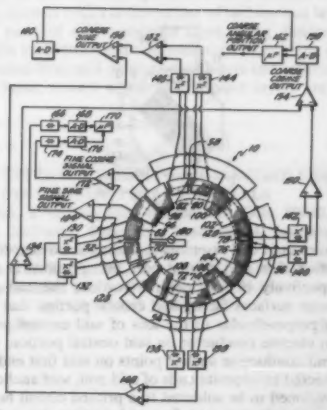
means including an annular member with a hole in its center for receiving said armature assembly and forming a side gap therebetween, and means on said annular member for receiving and retaining said spring means.

4,463,333

TRANSFORMER-TYPE POSITION TRANSDUCER

Frank S. Ruhle, Park Ridge, N.J., assignor to Farrand Industries, Inc., Valhalla, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,575
Int. Cl.³ H01F 21/04
U.S. Cl. 336—115 **14 Claims**



1. A position measuring device, comprising:
(a) first support means;
(b) second support means;
(c) mounting means for movably supporting said first support means in facing relationship to said second support means;
(d) a first multiplicity of elongated conductive poles having a first length electrically coupled to each other, and disposed side by side on said first support means, said poles being configured, positioned and dimensioned to move in a nonsymmetrical fashion with respect to said second support means, when said first support means is moved with respect to said second support means;
(e) a second multiplicity of elongated conductive poles having a second length, electrically coupled to each other, and coupled to said first multiplicity of poles, said second multiplicity being disposed side by side on said second

support means, said poles being configured, positioned and dimensioned to coincide lengthwise with the entire length of facing poles of said first multiplicity, regardless of the position at which said second support means is supported with respect to said first support means by said mounting means;

(f) a third multiplicity of elongated conductive poles having a third length, electrically coupled to each other, and coupled to said first multiplicity of poles, said third multiplicity being disposed side by side on said second support means, said poles being configured, dimensioned and positioned to coincide with a variable portion of the length of facing poles of said first multiplicity, the magnitude of said variable portion varying with the position at which said second support means is supported with respect to said first support means;

(g) means for measuring the electrical characteristics of said first multiplicity with respect to said second multiplicity to derive fine position information; and

(h) means for measuring the electrical characteristics of said first multiplicity with respect to said third multiplicity to derive coarse position information.

4,463,334

ELECTRIC COIL ON CORE WITH ANGLED END SURFACE

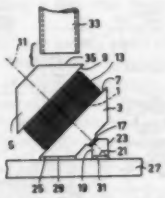
Frans H. M. Smeets, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,824

Claims priority, application Netherlands, Jul. 30, 1981, 8103601

Int. Cl.³ H01F *15/10, 27/30*

U.S. Cl. 336—192 **7 Claims**



1. In an electric coil assembly including a rod-shaped central core portion, first and second core end portions at opposite ends respectively of said central portion, the end portions having inner surfaces facing said central portion that are substantially perpendicular to the axis of said central portion, a coil of an electric conductor on said central portion, and first and second conductive anchor points on said first end portion and connected to opposite ends of said coil, said anchor points being positioned to be soldered to a printed circuit board; the improvement wherein said first end portion has a first end surface in a plane at an angle from 5 degrees to 85 degrees with respect to the axis of said central portion, all of said coil assembly being on one side of the plane of said first end surface, said first end surface having contact surfaces electrically connected to said anchor points.

4,463,335

MAGNETIC CIRCUIT FOR HIGH VOLTAGE CONTACTOR

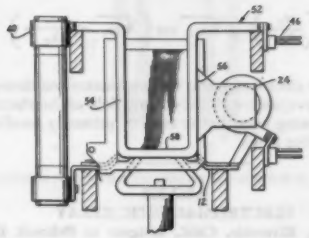
John D. Kleinecke, Wichita Falls, Tex., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed May 12, 1982, Ser. No. 377,397

Int. Cl.³ H01H *85/00, 9/44*

U.S. Cl. 337—4 **10 Claims**

1. A circuit interrupter assembly for opening and closing an electric circuit, comprising contact means for making and breaking electrical current flowing to a load, an arc chute having a first, lower end disposed adjacent the contact means and a second, upper end remote from said contact means, said arc chute receiving an arc having a translational force; magnetic pole pieces extending on either side of said arc chute and creating pole flux; a coil coupled in circuit with said contact means for inducing a magnetic field transversely through said arc chute between said pole pieces; first and second support means extending transversely to said arc chute at opposite sides of the second, upper end thereof; means on one support electrically coupled to one of the contacts; means on the other support for releasably engaging an electrical contact; and flux means for creating a conductor flux vectorially adding the conductor flux and pole flux and increasing the arc translational force and extending the current interruption capability of the arc chute, said flux means including a conductor having opposed ends secured to said support means and a generally U-shaped center section extending adjacent the outer face of at least one of said pole pieces, the center portion of said U-shaped section extending substantially to the lower edges of said pole pieces adjacent the contact means.



4,463,336

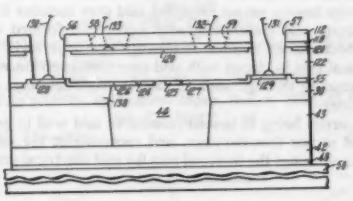
ULTRA-THIN MICROELECTRONIC PRESSURE SENSORS

James F. Black, Newington; Thomas W. Grudkowski, Glastonbury, and Anthony J. DeMaria, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 334,759, Dec. 28, 1981, Pat. No. 4,426,768. This application Jun. 24, 1983, Ser. No. 507,449

Int. Cl.³ G01L *1/22*

U.S. Cl. 338—4 **1 Claim**



1. A microelectronic device comprising:

a first silicon piece having an electronic device that has an electrical characteristic which varies with strain formed at a first surface thereof, said first piece being sufficiently thin to deflect in response to variations in ambient pressure sufficiently to provide a measurable variation in said electrical characteristic, access holes extending from a second surface of said first piece to said electronic device;

electrical conductors extending from said electronic device outward through said access holes;

a second silicon piece having a cavity formed at a first surface thereof;

said first surfaces of said pieces facing each other with said device adjacent said cavity; and

said pieces bonded together with borosilicate glass extending between said first surfaces except in the region of said device and said cavity.

4,463,337

TEMPERATURE MEASURING SENSORS AND METHODS FOR ADJUSTING SAME

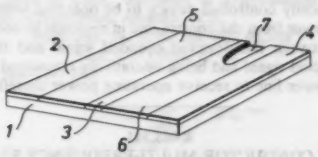
Bo H. Hakanson, Lund, Sweden, assignor to Crafon Medical AB, Sweden

Filed Apr. 13, 1982, Ser. No. 367,931

Claims priority, application Sweden, Apr. 15, 1981, 8102429

Int. Cl.³ H01C *10/00*

U.S. Cl. 338—22 R 4 Claims



1. A temperature measuring sensor whose resistance varies with temperature and having a predetermined resistance value comprising an electrically non-conductive base member, a first heat-sensitive material applied to a first portion of said electrically non-conductive base member, a second heat-sensitive material applied to a second portion of said electrically non-conductive base member, said second heat-sensitive material being substantially less sensitive to variations in temperature than said first heat-sensitive material, and an electrical contact portion applied to said electrically non-conductive base member, said first and second heat-sensitive materials being in substantial juxtaposition with each other, said electrical contact portion including a longitudinally extending first electrical contact portion between said first and second heat-sensitive materials, said longitudinally extending first electrical contact portion including first and second longitudinal sides, said first longitudinal side being in direct contact with said first heat-sensitive material and said second longitudinal side being in direct contact with said second heat-sensitive material, a second electrical contact portion in direct contact with a side of said first heat-sensitive material opposite that of said first electrical contact portion, and a third electrical contact portion in direct contact with an opposite side of said second heat-sensitive material from that of said first electrical contact portion, whereby said resistances of said first and second heat-sensitive materials can be separately measured across said first and second electrical contact portions, and said first and third electrical contact portions, respectively, at predetermined temperatures, the overall resistance for said temperature measuring sensor can be calculated therefrom, and the overall resistance of said temperature measuring sensor can be made to substantially correspond to said predetermined resistance value by adjusting only the resistance for said second heat-sensitive material.

4,463,338

ELECTRICAL NETWORK AND METHOD FOR PRODUCING THE SAME

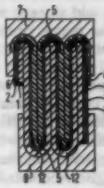
Ferdinand Utner, and Harald Vetter, both of Regensburg, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,113

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1980, 3032492

Int. Cl.³ H01C *3/00*

U.S. Cl. 338—281 10 Claims



1. Electrical network containing at least one electric resistor, comprising a support foil formed of electrically insulative material and at least one resistance layer coating said support foil in substantially the center thereof forming the at least one electric resistor, said support foil and resistance layer being folded along a zig-zag line forming folded edges, folded parts between said folded edges and an outer surface of said resistance layer, a ductile metal layer reinforcing said resistance layer in vicinity of said folded edges, contact layers each being disposed on said outer surface of said resistance layer, a plastic layer applied on said contact layers, and outer contact layers each making contact with a different one of said contact layers, said folded parts of said resistance layer being electrically insulated from each other and said resistance layer being electrically insulated from said outer contact layers and covered by said plastic layer, except where said contact layers are disposed.

4,463,339

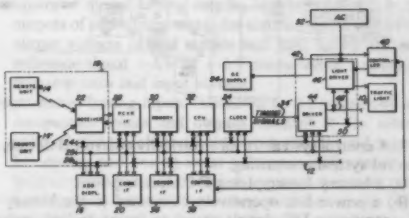
STATE/INTERVAL REDUNDANT CONTROLLER SYSTEM FOR TRAFFIC SIGNALS

Ralph E. Frick, 2740 Eliot Cir., Westminster, Colo. 80030, and Nelson E. McNulty, Edgewater, Colo. 80214, assignors to Ralph E. Frick, Westminster, Colo.

Continuation of Ser. No. 86, Jan. 2, 1979, abandoned. This application Jul. 1, 1981, Ser. No. 279,334

Int. Cl.³ G08G *1/07, 1/097*

U.S. Cl. 340—906 10 Claims



1. A traffic signal control system for operating an associated at least one traffic signal of the type having a plurality of indicators, comprising in combination:

(a) a first state/interval controller generating commands for the operation of a plurality of traffic signal indicators of an associated traffic signal through definition of individually selected states and definition of an individual time interval to be associated with each individual state for each indica-

tor; said controller including a clock means supplying time pulses for use by the controller in determining the end of a defined time interval associated with a defined indicator state, and a storage means for containing said individually selected current signal indicator state data and current interval definition data, wherein the controller determines the termination of the stored current interval in said storage means in response to time pulses received from said clock means, in response to said determined termination of the current interval generates an operating command for terminating said stored current state, individually selectes a next state and next interval, and loads said next state and next interval into said storage means; and

(b) signal light driver means operatively connected to said first controller for receipt of operating commands from the controller and operation of traffic signal indicators in response thereto wherein said storage means comprises:

a current interval register containing time data relating to an immediate state of a traffic signal indicator, having operative communication with said clock means and said signal light driver means; and

a current state register containing the identity of the immediate light state and in operative connection to the signal light driver means; and further comprising:

a next interval register containing time data relating to the state following the current state of the traffic signal indicator, having operative connection to said current interval register for loading the next interval time data after conclusion of the immediate light state, and having operative connection to said first controller for receiving subsequent interval time data; and

a next state register containing state identity data for the signal indicator in the interval following the immediate interval, having operative connection to said current state register for loading the next state data after conclusion of the current state, and having operative connection to said first controller for receiving subsequent state data.

4,463,340

ANTI-THEFT CONTROL SYSTEM

Joey B. Adkins, Willowick, and Jack W. Frantz, Mayfield Heights, both of Ohio, assignors to Darrell E. Issa, Cleveland, Ohio

Filed Sep. 18, 1981, Ser. No. 303,552
Int. Cl.³ B60R *25/04*
U.S. Cl. 340—64 **20 Claims**

1. A control system for an electrically controlled device, the control system comprising:

(a) a battery for supplying DC electric power;

(b) a power line operatively connected to the battery for conveying DC electric power to the controlled device;

(c) a DC powered sending module electrically connected with the power line to receive DC operating power therefrom, the sending module including:

(i) an encoding means for selectively generaing a preselected encoded electrical signal, the encoding means being operatively connected with the power line to receive operating power therefrom,

(ii) an actuating means for selectively actuating the encoding means to generate the encoded signal, the actuating means being operatively connected with the encoding means and being operatively connected with the power line to receive operating power therefrom, and

(iii) interface means for superimposing the encoded signal onto the DC electric power on the power line, the interface means being operatively connected with the encoding means to receive the encoded signal therefrom and being operatively connected with the power line to supply the encoded signal thereto and to receive operating power therefrom;

(d) at least one DC powered receiving module electrically connected with the power line to receive DC operating power therefrom, each receiving module including:

(i) a detector means for detecting and separating the encoded signal from the DC electric power, the detector means being operatively connected with the DC power line to receive the superimposed encoded signal and DC power therefrom and to receive operating electrical power therefrom,

(ii) a decoding means for comparing the detected encoded signal with at least one preselected signal, the decoding means being operatively connected with the detector means to receive the encoded signal therefrom and being operatively connected with the power line to receive operating power therefrom, and,

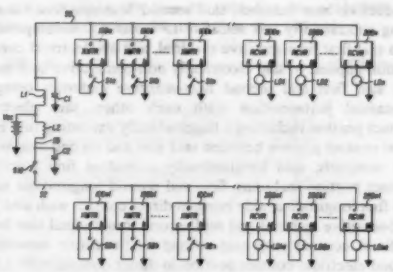
(iii) a control circuit for controlling the electrically controlled device, the control circuit being operatively connected with the decoding means to enable the electrically controlled device to be operated with the DC power from the control line in response to coincidence between the detected encoded signal and the preselected signal and being operatively connected with the power line to receive operating power therefrom.

4,463,341

SINGLE CONDUCTOR MULTI-FREQUENCY ELECTRIC WIRING SYSTEM FOR VEHICLES

Shinichiro Iwasaki, Troy, Mich., assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 1, 1981, Ser. No. 268,904
Int. Cl.³ H04Q *9/00*; G08C *14/12*
U.S. Cl. 340—310 A **6 Claims**



1. A wiring system comprising:

a source of electrical power;

at least one electrically conductive bus coupled to said source of power;

transmitting means coupled to receive a control input from a control source and coupled to said at least one conductive bus for receiving said power from said bus and for superimposing at least one control signal on said bus in response to said control input; and

receiver means coupled to said at least one conductive bus for receiving said power and said control signal from said bus and for coupling said power from said bus to a load in response to said control signal;

wherein said receiver means comprises:

bandpass filter means coupled to said at least one bus for receiving said control signal from said bus and for rejecting any other signals appearing on said bus, comprising,

input transformer means coupled to said at least one bus for stepping up the voltage levels of signals appearing on said bus, and crystal filter means coupled to the output of said input transformer means for filtering said signals appearing on said bus,

said crystal filter means coupling said received control signal to an output of said filter means;

detector means coupled to said output of said crystal filter means for generating a switching signal upon the detection of the presence of said received control signal at the output of said filter means; and

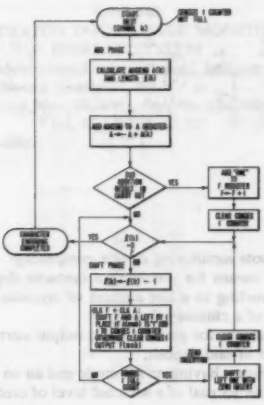
power switch means coupled between said at least one bus and said load and coupled to receive said switching signal from said detector means for coupling said power from said at least one bus to said load in response to said switching signal.

4,463,342

METHOD AND MEANS FOR CARRY-OVER CONTROL IN THE HIGH ORDER TO LOW ORDER PAIRWISE COMBINING OF DIGITS OF A DECODABLE SET OF RELATIVELY SHIFTED FINITE NUMBER STRINGS

Glen G. Langdon, Jr., San Jose, and Jorma J. Rissanen, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1979, Ser. No. 48,318
Int. Cl.³ H03K *13/00*
U.S. Cl. 340—347 DD **10 Claims**



1. A method for carry-over control in the encoding, selective transmitting (11) or storage, decoding, of a resultant number string C(sk) recursively formed by the high to low order combining ($C(s)+A(k)2^{-L(s)}$) of a pair of number strings, C(s), A(k), the resultant string being selectively transmitted or stored (5), and upon being accessed (19), the resultant string being recursively high to low order decomposed $C(s)=2^{k(k)}$ into the original pair of number strings, C(s), A(k), the method steps subsequent to each recursive string formation interval being executable upon an apparatus including a memory for temporarily storing segments of the resultant string whose segment length is less than the resultant string length, the method steps comprising:

detecting (61, 65, 67) n consecutive characters of a first kind in the resultant string C(sk);

increasing the resultant string length (67, 24) by at least one position and inserting (41, 45) a control character therein responsive to the detection of n characters to form a modified resultant string C' (sk); and

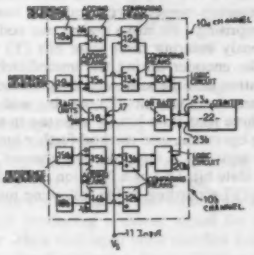
upon subsequent accessing (FIG. 4) of the modified resultant string C' (sk) and detection (73 msb, 77, 101) of n consecutive characters of the first kind, utilizing the control character value to operate the string decomposition in a carry correction manner (87, 89, 91, 83).

4,463,343

METHOD OF AND DEVICE FOR INCREMENTAL ANALOGUE-TO-DIGITAL CONVERSION

Philippe Guillemot, Paris, France, assignor to Mecilec, France

Filed Oct. 15, 1981, Ser. No. 311,746
Claims priority, application France, Oct. 16, 1980, 80 22104
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **7 Claims**



1. An analog to digital converter, comprising

a sample and hold circuit having an analog input to which is applied an analog input voltage to be digitized, a second input and an output at which an output voltage is provided;

adding means having outputs, first inputs to which reference signals $+\Delta V$ and $-\Delta V$ representing a quantization step are applied and second inputs connected to the output of said sample and hold circuit for adding the output voltage of said sample and hold circuit with said reference signals $+\Delta V$ and $-\Delta V$;

comparator means having outputs, inputs connected to the outputs of said adding means for comparing the sum of the output voltage of said sample and hold means and said reference signal $+\Delta V$ or $-\Delta V$ representing a quantization step with said input voltage;

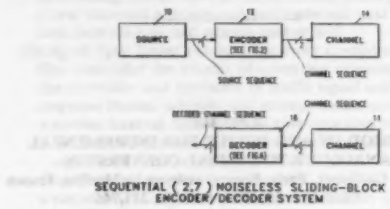
logic means having inputs connected to the outputs of said comparator means and outputs coupled to the second input of said sample and hold circuit for emitting a pulse for storing said analog input voltage in said sample and hold circuit when said comparator means detects equality between said analog input voltage and one or the other value of said sum and for simultaneously emitting a pulse having a plus sign or a minus according to whether said analog input voltage reaches one or the other value of said sum; and

totalling means having inputs connected to the outputs of said logic means for algebraically totalling the number of pulses emitted by said logic means thereby providing a digital indication of the magnitude of said analog input voltage.

4,463,344
METHOD AND APPARATUS FOR GENERATING A NOISELESS SLIDING BLOCK CODE FOR A (2,7) CHANNEL WITH RATE ⅔

Roy L. Adler, Stanford, and Martin Hassner, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,478
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD 5 Claims



SEQUENTIAL (2,7) NOISELESS SLIDING-BLOCK ENCODER/DECODER SYSTEM

1. A method for encoding a series of unconstrained binary input symbols into a run length limited (2,7) code having a ⅔ rate which comprises consecutively entering one new input symbol (X) comprising 1 bit into a logical tree coding network and simultaneously entering three state bits (Y) which were produced by the encoder during the immediately preceding encoding operation into the same encoding network and producing two channel outputs bits (Z) obeying said (2,7) encoding rules and three next state bits (Y') for use in the next succeeding coding operation, said method further including mapping the single input bit X into said two channel bits (Z) and said three next state bits (Y') as a function of the input bit (X) and 3 state bits (Y) according to the following mapping table:

Y \ X	0	1
0	3 / 0	4 / 0
1	2 / 0	2 / 2
2	5 / 1	6 / 1
3	5 / 2	6 / 2
4	3 / 0	2 / 2
5	2 / 0	1 / 0
6	3 / 0	0 / 0

LEGEND: Y' / Z

X = PRESENT INPUT

Y = (Y2 Y1 Y0) = STATE VECTOR

Y' = (Y2' Y1' Y0') = NEXT-STATE = $\tau(X,Y)$

Z = (Z1 Z0) = OUTPUT VECTOR = $\omega(X,Y)$

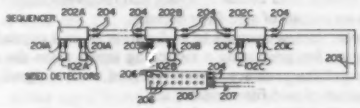
wherein the decimal values in said table are representative of the binary values manipulated by said method and wherein in the multibit binary vectors Y, Y' and Z, bits y2, y2', and z1 are the most significant bits.

4,463,345
SEED FLOW MONITOR

Simon W. J. H. Okkerse; Robert J. Friesen, and James D. J. Robar, all of Saskatoon, Canada, assignors to SED Systems Inc., Saskatoon, Canada

Filed Oct. 22, 1981, Ser. No. 313,531
Claims priority, application Canada, Oct. 23, 1980, 363074
Int. Cl.³ G08B *26/00*
U.S. Cl. 340—505 16 Claims

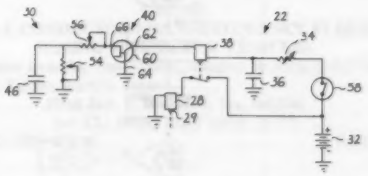
1. A seed flow monitor comprising:
(a) means for detecting the flow of seeds in a plurality of seed tubes,
(b) means for transmitting a pulse signal in the event of reduction of the rate of flow of seeds in any of the seed tubes below a predetermined minimum, the pulse signal being comprised of a first predetermined number of pulses, the transmitting means being adapted to transmit the pulses via serially connected pulse signal modification means associated with each one or group of seed tubes,
(c) the pulse modification means being adapted to receive a series of pulses transmitted thereto and to transmit a different number of pulses to a further serially connected similar modification means or to the central display means, the character of a resulting pulse signal representing the serial placement of one or a group of seed tubes relative to other ones or groups of seed tubes, and
(d) central display means for detecting the modified pulse signal and indicating the detected reduction of the flow of seeds on a display, the indicated display corresponding to the placement of the one or group of seed tubes.



4,463,346
CREOSOTE DETECTOR

Gordon Bates, Rte. 1, Box 29B, Nixa, Mo. 65714

Filed Feb. 16, 1982, Ser. No. 349,002
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—540 14 Claims



1. A creosote monitoring device comprising:
collection means for receiving a creosote deposit thereon corresponding to a like amount of creosote deposit on a portion of a chimney flue;
detection means for producing an output corresponding to the level of said deposit;
an alarm circuit having an off mode and an on mode indicative of the accrual of a selected level of creosote deposit; and
trigger means operably responsive to a selected output corresponding to said selected level of creosote for actuating said alarm circuit into said on mode.

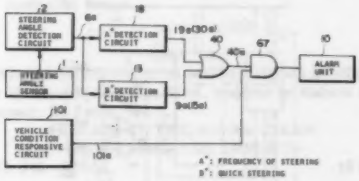
4,463,347
DROWSINESS ALARM SYSTEM FOR A VEHICLE

Yasutoshi Seko, Yokohama, and Takayuki Yanagishima, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 21, 1981, Ser. No. 304,254
Claims priority, application Japan, Sep. 22, 1980, 55-135094[U]; Sep. 22, 1980, 55-132060; Oct. 6, 1980, 55-139661
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—576 30 Claims

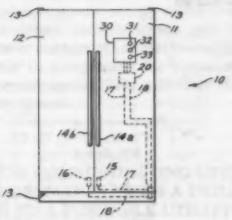
1. A drowsiness alarm system for a vehicle for producing a warning in the event of driver drowsiness as determined from vehicle steering changes, comprising:

(a) an alarm unit which produces an alarm in a predetermined form in response to a pulse inputted thereto;
(b) a steering angle sensor which generates a signal indicative of the angle through which a steering wheel is turned;
(c) a steering angle detection circuit, connected to said steering angle sensor, which outputs a pulse each time the vehicle steering angle changes by a predetermined amount; and



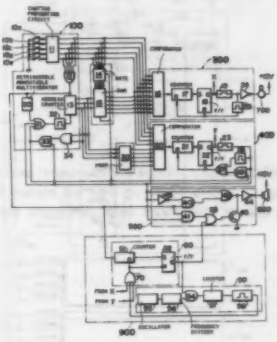
(d) a quick steering detection circuit, connected to said steering angle detection circuit, for outputting a pulse to said alarm unit whenever the number of pulses from said steering angle detection circuit inputted thereto within a predetermined period of time following receipt of the first of said steering angle detection circuit pulses exceeds a predetermined number,
whereby said alarm unit is activated in response to detection of an abrupt or sudden steering operation.

4,463,348
REFRIGERATOR DOOR USAGE MONITOR AND DISPLAY SYSTEM
Donald L. Sidebottom, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Nov. 23, 1981, Ser. No. 324,305
Int. Cl.³ G08B *17/00*
U.S. Cl. 340—585 **10 Claims**



1. Refrigerator door usage monitor and display system comprising:
clock means;
means for sensing when a refrigerator door is open;
a microcomputer including accumulator means responsive to the door-open sensing means and to the clock means for accumulating a count representative of the amount of door-open time occurring in each of a plurality of successive time segments, and arithmetic means responsive to the accumulator means for periodically calculating and providing an output signal representative of the rolling average door-open time for a predetermined number of said successive time segments;
and display means responsive to said microcomputer output signal for providing visual indicia to indicate when the rolling average door-open time is greater than a predetermined normal range of rolling average door-open times.

4,463,349
ELECTRONIC LOCK SYSTEM WITH AUDIBLE ENTRY MONITOR
Haruo Mochida, Yokohama; Keiichi Shimizu, Tokyo, and Hirotoshi Namazue, Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Tokyo, Japan
Filed Sep. 29, 1982, Ser. No. 428,234
Claims priority, application Japan, Oct. 2, 1981, 56-156097
Int. Cl.³ H04Q *4/00*; E05B *49/00*
U.S. Cl. 340—825.32 **9 Claims**



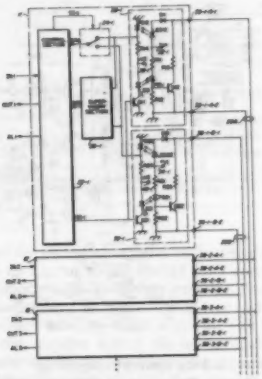
1. An electronic lock system comprising:
a lock mechanism including an actuator;
a pushbutton input unit having a plurality of push buttons for entry of an input code;
a memory for storing a preset code which is read out in response to entry of said input code;
a comparator for comparing said input code with said preset code and producing a driver signal for operating said actuator when said input code matches said preset code;
an audible signal generator for confirming entry of input code whenever one of said push buttons is depressed; and
a counter means associated with said audible signal generator for counting occurrence of entry of code elements of said input code and producing a disabling signal for disabling said audible signal generator for a predetermined time when the counter value exceeds a given threshold.

4,463,350
COMMUNICATION SYSTEM HAVING DESIGNATED TRANSMISSION LINES
Koichi Kajiura, 4683, Seyamachi, Seya-Ku Yokohama-city, Kanagawa, Japan (246); Kozo Edanami, 88-27 Sachigaoka, Asahi-Ku Yokohama-city, Kanagawa, Japan (241); Seiji Onoki, 12-1-308 Nishitsujido Danchi, Tsujido, Fujisawa-city, Kanagawa, Japan (251); Tatsuya Izumina, 5-7-401 Zengyo Danchi, 3768-8 Fujisawa, Fujisawa-city, Kanagawa, Japan (251), and Yasuo Kumeda, 121-15 Harajukucho, Totsuka-Ku Yokohama-city, Kanagawa, Japan (247)
Filed Feb. 16, 1982, Ser. No. 349,108
Claims priority, application Japan, Feb. 16, 1981, 56-21007
Int. Cl.³ H04Q *11/04*; H04J *3/02, 3/14*
U.S. Cl. 340—825.01 **5 Claims**

1. In a communication system in which "n" communication devices communicate over "a" transmission lines where "n" and "a" are integers greater than 0, each of said communication devices including transmitting means for transmitting binary-coded information simultaneously over each of the transmission lines, each of said communication devices having receiving means for receiving signals from any one of said transmission lines, one of said communication devices being the master device and the remaining (n−1) devices being designated as slave devices, the master device executing repetitively a cycle of operation, the master device during each cycle

of operation transmitting a polling signal addressed to a different one of the slave communication devices until a polling signal addressed to each slave device is transmitted, each slave device upon the receipt of a polling signal addressed to it transmitting a request for data to other devices identified in its request, or transmitting an answer to a requesting device in response to a request addressed to it, or not transmitting if it does not have a request, an answer, or anything else to transmit;

the improvements comprising:



the master device beginning each of its cycles of operation by transmitting a transmission line designation signal addressed to all devices, the receipt of which causes each of the devices receiving the transmission line designation signal to receive signals only from the designated transmission line; the master device upon completion of one duty cycle initiating a succeeding duty cycle by transmitting at the beginning of said succeeding duty cycle a transmission line designation signal designating a transmission line other than that designated during the immediately preceding duty cycle.

4,463,351

SYSTEM FOR PROVIDING SEVERAL DATA TERMINALS WITH ACCESS TO A DIGITAL TELEPHONE LINE

Volmer Chiarottino, Villanova Can-se, Italy, assignor to Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 11, 1982, Ser. No. 357,276

Claims priority, application Italy, Mar. 12, 1981, 67345 A/81

Int. Cl.³ H04Q *9/00*

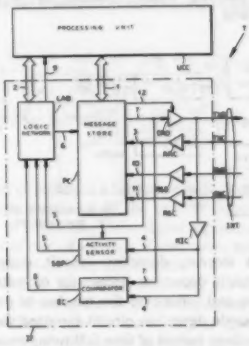
U.S. Cl. 340—825.5 **5 Claims**

1. A telecommunication system with several terminals equipped for the transmission and reception of data over a line linking said terminals with an exchange, each of said terminals comprising a processing unit communicating with said line by way of an associated interface coupled to said line via a two-way bus including an incoming-data lead, an outgoing-data lead and at least one signal lead carrying clock pulses generated at said exchange, each of said leads having branches extending in parallel to all said terminals, said interface comprising:

activity-sensing means with a data input connected to said outgoing-data lead and with a control input connected to said signal lead for ascertaining the free or busy state of the line from signal levels detected in a predetermined number of consecutive time slots assigned to data transmission;

storage means loadable with an outgoing message from said processing unit and connected to a message transmitter inserted in said outgoing-data lead;

logical circuitry responsive to a command from said processing unit for initiating the emission of a message preceded by an invariable address code, loaded into said storage means, in the presence of a line-free signal from said activity-sensing means, said storage means being controllable by said clock pulses to emit successive bits of said address code in respective time slots before sending out the message; and



comparison means with inputs connected to said outgoing-data lead upstream and downstream, respectively, of said message transmitter for detecting a possible coincidence of an emitted address bit with a higher-priority bit from another terminal and halting the emission of further bits by said message transmitter in the presence of such coincidence.

4,463,352

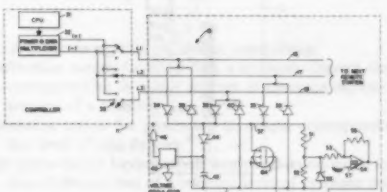
FAULT TOLERANT, SELF-POWERED DATA REPORTING SYSTEM

Ronald L. Forbes, McHenry County, and Richard G. Winkler, Cook County, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 6, 1982, Ser. No. 395,361

Int. Cl.³ H04Q *9/00*; G08B *19/00*

U.S. Cl. 340—825.05 **32 Claims**



1. A fault tolerant, self-powered data gathering system comprising:

communication means having at least three lines;

controller means connected to said communication means for receiving data messages from remote stations and for supplying power to said remote stations, said controller means having selection means for selecting a pair of said at least three lines over which said data messages can be received, said pair also supplying said power to said remote stations; and,

a plurality of remote stations connected to said communication means, each remote station comprising

rectifier bridge means connected to said at least three

lines, said rectifier bridge means accepting a power supply of either polarity and bidirectional data flow,

power storage means connected to said rectifier bridge means for storing and power supplied by said controller means,

data message means for transmitting data messages to said controller means, and

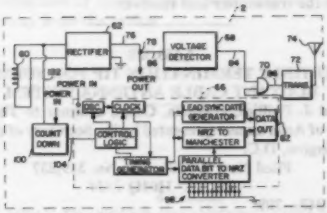
transmitter means connected to said rectifier bridge means and to said data message means for transmitting said data messages over said communication means to said controller means.

4,463,353

ANIMAL FEEDING AND MONITORING SYSTEM

James H. Kuzara, Sheridan, Wyo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Aug. 17, 1981, Ser. No. 293,314
Int. Cl.³ H04Q *9/00*; G01S *9/56*
U.S. Cl. 340—825.54 **16 Claims**



1. Apparatus for producing a unique coded signal to be used in a system for feeding and monitoring animals comprising an electronic identity means for identifying each animal, said electronic identity means including a power pick-up means for receiving electromagnetic energy and for providing a supply of operating power in response to the electromagnetic energy so received, and a code generator means connected to receive operating power from said power pick-up means for generating a coded signal uniquely associated with each animal to be identified, and an electromagnetic field generator means for generating the electromagnetic energy received by the pick-up means of said electronic identity means and for selectively increasing the power content of the electromagnetic energy so generated in order to compensate for variations in distance between said electromagnetic field generator means and said electronic identity means.

4,463,354

APPARATUS FOR COMMUNICATING UTILITY USAGE RELATED INFORMATION FROM A UTILITY USAGE LOCATION TO A PORTABLE UTILITY USAGE REGISTERING DEVICE

Lawrence M. Sears, 23945 Merchantile, Cleveland, Ohio 44122

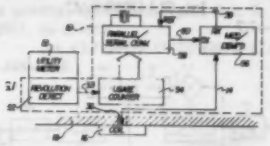
Filed Dec. 9, 1981, Ser. No. 328,950
Int. Cl.³ G08C *19/00*; G01D *9/00*
U.S. Cl. 340—870.02 **19 Claims**

19. Apparatus for determining utility usage at a utility usage location, and for electrically communicating a related utility usage signal to a portable utility usage recording device carried from one utility usage location to another, comprising:

counter means responsive to utility usage for accumulating a count representative of total utility usage,

triggerable modulator means for, when triggered, modulating a carrier signal in accordance with said count,

coil means mountable in a readily accessible location and coupled to said modulator means for receiving said modulated carrier therefrom, said coil means providing a magnetic field which varies in accordance with said modulated carrier, said magnetic field being accessible such that a portable magnetic field responsive means associated with said portable utility usage recording device can be disposed within said magnetic field so as to receive said modulated carrier therefrom, and



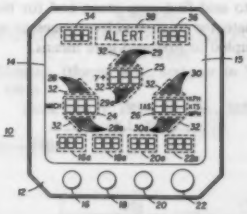
receiver means responsive to signals magnetically induced in said coil means by said portable utility usage recording device for triggering said modulator means in response thereto.

4,463,355

SOLID STATE MACH/AIR SPEED INDICATOR

Elmer L. Schultz, Marion, and Lee R. Fredrickson, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 26, 1982, Ser. No. 352,811
Int. Cl.³ G08B *5/36*
U.S. Cl. 340—971 **16 Claims**



1. In a system for calculating and displaying a parameter, the improvement comprising:

means for providing a signal representing the magnitude of the rate of change of the parameter;

a first display group having a plurality of individual display elements arranged in a predetermined display pattern;

a second display group having a plurality of individual display elements arranged in a predetermined display pattern; and

means for causing said elements of said first display group to visually appear in a sequential and cyclic manner at a repetition rate proportional to the magnitude of the rate of change of said parameter during a first condition of said parameter and for causing said elements of said second display group to visually appear in a sequential and cyclic manner at a repetition rate proportional to the magnitude of the rate of change of said parameter ducing a second condition of said parameter.

4,463,356

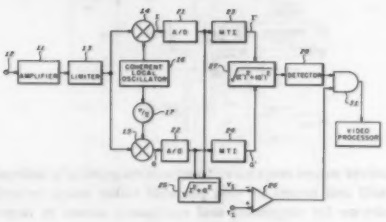
APPARATUS FOR CONTROL OF CLUTTER BREAKTHROUGH IN MTI RADAR

Robert D. Short, III, Littleton; Clarence L. Bennett, Jr., Groton; Richard M. Barnes; Robert S. Smith, both of Acton, all of Mass., and Harold W. Pyle, Burnsville, Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,730

Int. Cl.³ G01S 9/42

U.S. Cl. 343—7.7 **5 Claims**



1. In a radar system of the type including an i.f. signal amplifier coupled to moving target indicator (MTI) processor means, a detector coupled to the MTI processor means, and a video processor coupled to the detector, wherein the improvement comprises:

means coupled in parallel with said MTI processor means for providing signals representative of magnitudes of i.f. signals coupled to said MTI processor means;

first comparator means coupled to receive said magnitude representative signals, and a first threshold signal for providing a first signal when said magnitude representative signals exceed, said first threshold signal, and a second signal when said magnitude representative signals do not exceed said first threshold signal; and

first gate means coupled to receive signals from said detector and said first comparator means for providing signals from said detector to said video processor when said second signal is coupled to said first gate mean and for blocking signals from said detector to said video processor when said first signal is coupled to first said gate means.

4,463,357

METHOD AND APPARATUS FOR CALIBRATING THE IONOSPHERE AND APPLICATION TO SURVEILLANCE OF GEOPHYSICAL EVENTS

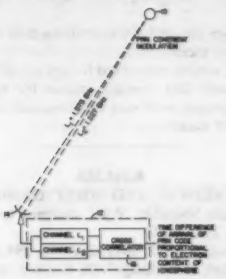
Peter F. MacDoran, Pasadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 17, 1981, Ser. No. 322,317

Int. Cl.³ G01S 3/02

U.S. Cl. 343—460 **7 Claims**

1. A method of calibrating the electron columnar content in the space between a transmitter on a spacecraft and a receiver on Earth comprising the steps of: transmitting from said transmitter two broadband signals separated in frequency, each coherently modulated by pseudorandom noise; receiving in a direct path from said transmitter both of said signals at a receiver having two channels for obtaining said modulations on said two signals; and cross correlating the modulation of one received signal to the modulation of the other received signal to determine the phase difference between the modulation of said one received signal to the modulation of said other received signal as a measure of electron content in the space between the transmitter and receiver.



4,463,358

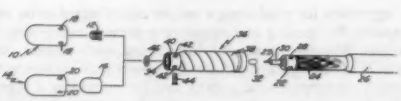
CONVERTIBLE TERMINATION TIP FOR SUBMARINE BUOYANT CABLE ANTENNA SYSTEM

Raymond J. Phillips, Oakdale, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 9, 1981, Ser. No. 319,537

Int. Cl.³ H01Q 1/34

U.S. Cl. 343—709 **6 Claims**



1. A grounding termination tip configuration comprising:

a buoyant cable having a single conductor with a dielectric covering;

connecting means for connecting to said buoyant cable;

a spring socket contact connected and making electrical contact to the single conductor of said buoyant cable;

an electrical conducting metallic nosepiece connected, making electrical contact and partially enclosing said spring socket contact and connecting to said connecting means; and

an O-ring fitted over said dielectric covering of said single conductor and abutting said electrical conducting metallic nosepiece for providing an environmental seal for said single conductor.

4,463,359

DROPLET GENERATING METHOD AND APPARATUS THEREOF

Naoki Ayata; Yoshiaki Shirato, both of Yokohama; Yasushi Takatori, Sagamihara, and Mitsuaki Seki, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 133,327

Claims priority, application Japan, Apr. 2, 1979, 54-39467; Apr. 2, 1979, 54-39468; Apr. 2, 1979, 54-39469; Apr. 2, 1979, 54-39470; Apr. 2, 1979, 54-39471; Apr. 2, 1979, 54-39472; Apr. 11, 1979, 54-43849; Feb. 22, 1980, 55-21348

Int. Cl.³ G01D 15/18

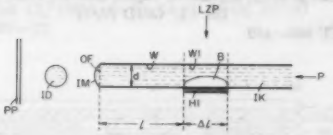
U.S. Cl. 346—1.1 **51 Claims**

21. A liquid jet ejection process in which a pulse of energy is applied to a liquid chamber to heat liquid therein causing emission of a liquid droplet from an outlet orifice of said liquid chamber, said process comprising the steps of:

generating a pulse of energy for use in heating the liquid;

applying said pulse of energy to said chamber;

controlling the generation of said pulse of energy to produce a period of increase in temperature in the liquid followed by a period of decrease in temperature, wherein the period of increase is less than the period of decrease; and



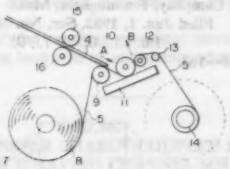
further controlling said pulse of energy so that the period of increase in temperature causes said liquid to protrude progressively from the orifice, and so that the period of decrease in temperature causes the protruding liquid to constrict at the orifice to form a droplet followed by a retraction of the remaining liquid into said chamber and away from the orifice.

4,463,360

HEAT TRANSFER RECORDING APPARATUS

Yoshiki Kikuchi; Takashi Ohmori, and Haruhiko Moriguchi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 312,020
Claims priority, application Japan, Oct. 17, 1980, 55-144419
Int. Cl.³ G01D *15/10, 15/34*
U.S. Cl. 346—76 PH **1 Claim**



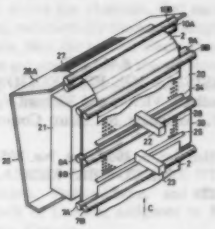
1. A heat transfer recording apparatus comprising first source means for supplying a heat transfer-type ink donor film, second source means for supplying a recording medium, a recording station having heating means and a transport system by which said ink donor film and said recording medium are delivered from said first and second source means independently of each other and are brought into superimposed contact with one another at a point prior to said recording station for movement in the same direction for simultaneous passage through said recording station, said transport system including a donor film guide roller in the travel path of said donor film between said film source and the point of contact with said film guide roller determining the path of said donor film at said point of contact regardless of any change in said second source means, and said recording station including a second roller around which said superimposed film and recording medium pass with said medium in contact with said roller and said heating means disposed adjacent said donor film in the vicinity of said second roller for selectively heating said film for recording information on said recording medium by heat transfer.

4,463,361

INK JET RECORDING APPARATUS WITH VACUUM PLATEN

Noboru Koumura, Narashino; Naoki Ayata, Machida; Seiji Saito, Yokosuka; Hidetoshi Suzuki, and Kunitaka Ozawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,704
Claims priority, application Japan, Oct. 7, 1981, 56-158656; Oct. 7, 1981, 56-158658
Int. Cl.³ G01D *15/18*; G03B *27/60*
U.S. Cl. 346—134 **3 Claims**



1. An ink jet recording apparatus comprising:

means for carrying a recording paper while transmitting a carrying force to said recording paper;

ink jet recording means for recording on the recording paper;

a suction member stationarily provided opposed to said recording means and having a plural number of openings formed in an area of the suction member within the width of the recording paper; and

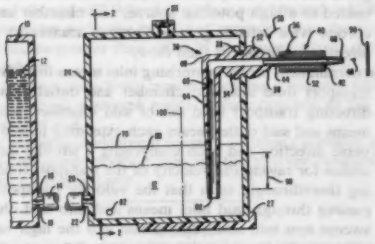
suction means for applying a suction force to the recording paper through the openings during recording, said recording paper passing on said suction member in intimate contact therewith.

4,463,362

INK CONTROL BAFFLE PLATES FOR INK JET PRINTER

Jacob E. Thomas, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 7, 1982, Ser. No. 385,967
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R **15 Claims**



1. Means for preventing excessive ink movement comprising a

reservoir containing a supply of ink at an operating level therein and operably associated with and carrying a plurality of ink jet print heads,

conduit means associated with each of the print heads and with the supply of ink for providing ink to the print heads in individual manner,

means for causing the reservoir and the print heads to be accelerated and decelerated in rapid motion during printing operation, and

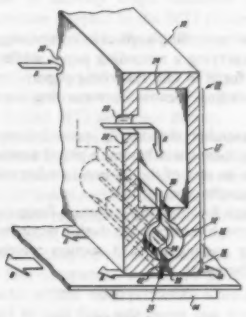
baffle means within the reservoir integral therewith and extending upwardly above the operating level of the ink and forming separate chambers for the conduit means and preventing excessive motion of the ink in a lateral direction within the reservoir during printing operation.

4,463,363

FLUID ASSISTED ION PROJECTION PRINTING

Robert W. Gundlach, Victor, and Richard F. Bergen, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 6, 1982, Ser. No. 395,170
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—159 **6 Claims**



1. A fluid jet assisted electrographic marking apparatus for placing electrostatic charges upon a charge receptor in an image-wise pattern, said apparatus being characterized by including

transport fluid supply means,

ion generation means comprising an electrically conductive chamber, connected to a reference potential, and an elongated corona wire positioned in said chamber and connected to a high potential source, said chamber and said corona wire extending in a direction transverse to the direction of transport fluid flow,

ion entrainment means comprising inlet means for delivering transport fluid into said chamber and outlet means for directing transport fluid out of said chamber, said inlet means and said outlet means each extending in said transverse direction and each comprising a slit-like metering orifice for raising the velocity of the transport fluid passing therethrough, such that the velocity transport fluid passing through said inlet means and into said chamber sweeps ions into said outlet means and the high velocity transport fluid passing through said outlet means inhibits charge spreading in said outlet means, and

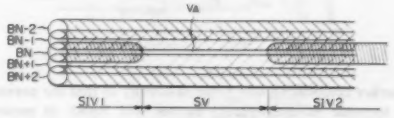
modulation means comprising a plurality of spaced, individually controllable, electrodes located adjacent the path of the exiting ion entraining transport fluid, each electrode selectively connectible to a low potential source for neutralizing the ions in selected portions of the exiting entraining fluid, whereby the ions allowed to pass to the charge receptor represent a desired charge pattern.

4,463,364

IMAGE FORMING PROCESS AND APPARATUS THEREFOR

Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,443
Claims priority, application Japan, Oct. 16, 1980, 55-143729
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—160 **3 Claims**



1. An image forming apparatus for forming an image, based on image information, on a photosensitive member, said apparatus comprising:

means for generating a light beam;

means for driving said light beam generating means to form an image on the photosensitive member by scanning the photosensitive member with said light beam; and

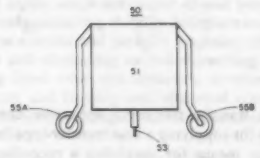
means for controlling said drive means to regulate the intensity of said light beam generated by said light beam generating means in accordance with the image information representing at least one of the preceding and succeeding scanning with said light beam.

4,463,365

ELECTROSENSITIVE PRINTING TECHNIQUE

Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jun. 1, 1982, Ser. No. 383,675
Int. Cl.³ G01D *15/08*
U.S. Cl. 346—163 **8 Claims**



1. Improved apparatus for imprinting electrosensitive metalized label stock having a plurality of electrically isolated labels, of the type including a conductive printing member which is disposed near the metalized surface, grounding means which contact the metalized surface nearby, and means for applying a print voltage between the printing member and the grounding means to actuate the printing member and cause removal of the metalized surface in the vicinity of the printing member, wherein the improvement comprises improved grounding means comprising:

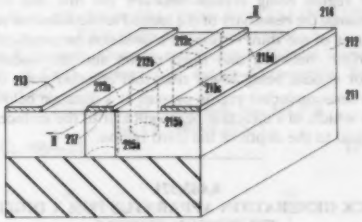
a pair of ground electrodes forming an integral assembly with said printing member, wherein said ground electrodes straddle a printing member in a direction of relative motion between the metalized labels and the printing apparatus, and are separated by less than the dimension of labels in this direction.

4,463,366

FIELD EFFECT TRANSISTOR WITH COMBINATION SCHOTTKY-JUNCTION GATE

Yasunobu Ishii, Tokyo; Kazuyoshi Asai, Iruma, and Katsuhiko Kurumada, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp., Chiyoda, Japan

Filed Jun. 20, 1980, Ser. No. 161,630
Int. Cl.³ H01L 29/80, 29/48, 29/06, 29/161
U.S. Cl. 357—22 3 Claims



1. A field effect transistor device comprising a semiinsulating layer made of a compound semiconductor,

a compound semiconductor layer of a first conductivity type which is disposed on said semiinsulating layer,

at least two semiconductor gate regions of a second conductivity type different from the first conductivity type which extend from a main surface of the semiconductor layer substantially to said semiinsulating layer and which are mutually spaced by a predetermined amount,

source and drain electrodes each arranged on opposite sides of said semiconductor gate regions to have an ohmic contact with said compound semiconductor layer of first conductivity type, and

a gate electrode means which has an ohmic contact with said semiconductor gate regions and which further has a Schottky contact with the semiconductor layer interposed between the semiconductor gate regions to form at least one Schottky gate region between said semiconductor gate regions,

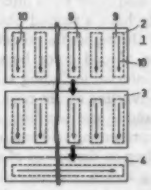
the periphery of the resulting transistor device being in contact with at least two of said semiconductor gate regions.

4,463,367

FRAME-TRANSFER CHARGE-COUPLED IMAGE SENSOR DEVICE HAVING CHANNEL SOUNDING REGIONS BELOW LIGHT-ADMITTING WINDOWS

Marnix G. Collet, Sunnyvale, Calif., assignor to U.S. Philips Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 235,212, Feb. 17, 1981, abandoned.
This application Aug. 23, 1983, Ser. No. 525,791
Claims priority, application Netherlands, Feb. 19, 1980, 8000999
Int. Cl.³ H01L 29/78, 27/14, 31/00
U.S. Cl. 357—24 6 Claims



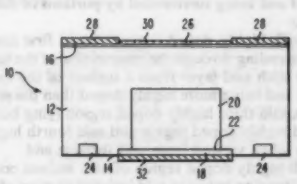
1. A charge coupled image sensor device for receiving a radiation image and converting it into an electrical signal, wherein a number of substantially parallel charge transport channels spaced apart from one another are situated in a semiconductor body along a major surface thereof, the body has channel bounding regions which laterally bound the channels along substantially their entire lengths so as to electrically separate them, an electrode system for controlling charge transport in the channels lies on an insulating layer at the major surface and has windows for allowing in particular short-wave light of the radiation image to penetrate into the body and generate charge carriers therein, and a group of first electrodes in the system extends across all of the channels substantially transverse to their longitudinal direction, characterized in that the system includes a group of second electrodes situated apart from one another above the channels, that each second electrode extends along substantially the entire length of a different one of the channels, that the second electrodes together with the first electrodes are not present at the windows, and that the channel bounding regions are situated below substantially the entire areas of the windows.

4,463,368

SILICON AVALANCHE PHOTODIODE WITH LOW K_{eff}

Robert J. McIntyre, Pointe-Claire, and Paul P. Webb, Beaconsfield, both of Canada, assignors to RCA, Inc., Ste-Anne-de-Bellevue, Canada

Filed Nov. 20, 1981, Ser. No. 323,199
Claims priority, application Canada, Oct. 6, 1981, 387432
Int. Cl.³ H01L 27/14
U.S. Cl. 357—30 5 Claims



1. An avalanche photodiode comprising

a π-type conductivity silicon body having a pair of opposed major surfaces;

an n-type conductivity region extending a distance less than about 10 micrometers into the body from a portion of a first major surface thereof;

a p-type conductivity region contacting the n-type region, containing acceptors in an uncompensated excess concentration corresponding to a dose of between about 1×10^{12} and about $3\times10^{12}/cm^2$ of surface area through which the acceptors enter the body, and extending into the body a distance greater than about 35 micrometers from the first surface;

a p^+-type conductivity region extending a distance into the body from a second major surface opposite to the first surface; and

first and second electrical contacts overlying portions of the n-type conductivity region and the p^+-type conductivity region respectively.

4,463,369

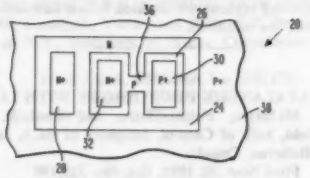
INTEGRATED CIRCUIT OVERLOAD PROTECTION DEVICE

Jack R. Harford, Raritan Township, Hunterdon Co., N.J., assignor to RCA, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,325
Int. Cl.³ H01L 27/02, 27/04
U.S. Cl. 357—44 6 Claims

1. An integrated circuit voltage overload protection device comprising:

(a) a semiconductor substrate of a first conductivity type;
(b) a layer of semiconductor material of a second conductivity type overlying said substrate;
(c) a first highly doped region of said first conductivity type, extending through said layer to said substrate and completely surrounding a portion of said layer, whereby said portion of said layer is isolated from the remainder of said layer;
(d) first and second well regions of said first conductivity type, each well region partially extending into said isolated portion of said layer from a surface thereof, the well regions connected to each other by a narrow, highly doped region of the first conductivity type;
(e) a second highly doped region of said second conductivity type, extending into said isolated portion of said layer from a surface thereof and separated by portions of said layer from the first well region;



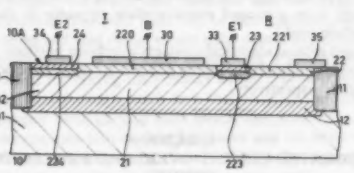
(f) a third highly doped region of said second conductivity type extending into the first well region from a surface thereof and being surrounded by portions of the first well region;
(g) a fourth highly doped region of said first conductivity type extending through the intersection of the second well region with said layer from a surface of the second well region and being more highly doped than the second well region, said third highly doped region lying between said second highly doped region and said fourth highly doped region when viewed from said surface; and
(h) a fifth highly doped region of said second conductivity type extending between said isolated portion of said layer and said substrate, said fifth highly doped region underlying at least said second and third highly doped regions but not underlying said fourth highly doped region.

4,463,370

SEMICONDUCTOR DEVICE FOR USE IN MEMORY CELLS

Didier J. R. Grenier, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,691
Claims priority, application France, Nov. 7, 1980, 80 23825
Int. Cl.³ H01L *27/04*
U.S. Cl. 357—50 **3 Claims**



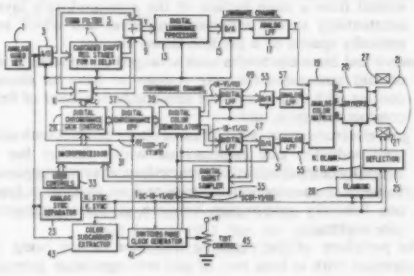
1. A semiconductor device having a semiconductor body comprising at least a surface-adjoining island-shaped region which is bounded by a sunken dielectric and in which a first transistor and a first resistive zone are provided, said island-shaped region having a first semiconductor region of a first conductivity type which comprises a collector region of the transistor, an overlying, surface-adjoining second semiconductor region of a second conductivity type opposite to the first which comprises a base of the transistor and the resistive zone and in which at least a third and a fourth surface region of the first conductivity type which form emitter regions of the transistor are provided, the resistive zone comprising a part of the second semiconductor region between first and second connections to the second semiconductor region, said first connection also forming the base contact of the transistor, the third surface region of the first conductivity type which forms an emitter region being present between the first and second connections, the resistivity of the second semiconductor region at the area of the third region, in a direction perpendicular to the surface, between said third region and the underlying collector region, being lower than that of other parts of the second semiconductor region present at a distance below the surface which, in a direction perpendicular to the surface, is at least equal to the depth of the third region.

4,463,371

CLOCK GENERATION APPARATUS FOR A DIGITAL TELEVISION SYSTEM

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 383,290, May 28, 1982, abandoned. This application May 17, 1983, Ser. No. 493,805
Int. Cl.³ H04N *5/04*
U.S. Cl. 358—13 **11 Claims**



1. A digital television signal processing apparatus, comprising:
a source of a composite analog television signal representing luminance and chrominance information of an image including image and non-image intervals, said non-image intervals including a color burst interval in which a color burst signal component occurs;
sampling signal generating means responsive to said analog television signal for generating a sampling signal including a series of pulses and for selectively causing said sampling signal to have a first phase condition fixed relative to the phase of said color burst signal component during a first interval within said non-image interval which includes at least a portion of said color burst interval and causing said sampling signal to have a second phase condition adjustable substantially throughout a predetermined range relative to the phase of said color burst signal component during a second interval including said image interval;
analog to digital converting means responsive to said analog television signal and to said sampling signal for generating digital samples representing said analog television signal at times corresponding to the pulses of said sampling signal;
color burst sampling means responsive to said digital television signal samples and to said sampling signal for selecting particular ones of said digital television signal samples corresponding to respective pulses of said sampling signal

occurring during said first interval in order to evaluate the amplitude of said selected digital television samples; and

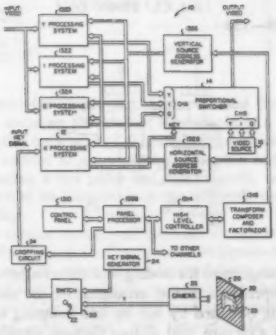
color demodulating means responsive to said digital television signal samples and to said sampling signal for selecting particular ones of said digital television signal samples corresponding to respective pulses of said sampling signal occurring during said second interval in order to produce digital samples representing the tint of said image.

4,463,372

SPATIAL TRANSFORMATION SYSTEM INCLUDING KEY SIGNAL GENERATOR

Phillip P. Bennett, Alameda, and Steven A. Gabriel, Santa Clara, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 24, 1982, Ser. No. 361,576
Int. Cl.³ H04N *9/535*
U.S. Cl. 358—22 **12 Claims**



1. A video special effects system comprising:

at least one video processing system coupled to receive an input video signal representing a video image and output an output video signal representing an operator selected spatial transformation of the video image;

a key processing system coupled to receive an input key signal defining a portion of the video image selected for viewing and to operate in tandem with the at least one video processing system to generate an output key signal which has undergone the same selected spatial transformation relative to the input key signal as the video image.

4,463,373

PREVIEWING APPARATUS OF FLATS

Atsutoshi Mikami, Sakado, Japan, assignor to Toppan Printing Co., Ltd., Japan

Filed Dec. 23, 1981, Ser. No. 333,993
Claims priority, application Japan, Dec. 25, 1980, 55-184480
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—76 **12 Claims**

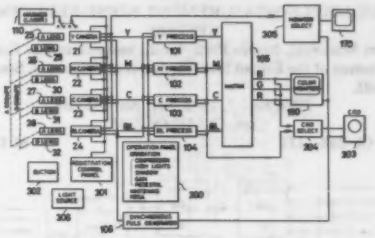
1. A previewing apparatus, comprising:

a flat setting table having a plurality of spaced flat support areas each being capable of supporting a respective color separation flat;

a plurality of television cameras, each said camera being associated with a respective said flat support area and having a magnifying lens which permits said camera to view only a portion of its associated flat support area at any given instant;

a support structure for maintaining said cameras in fixed positions relative to one another and for permitting relative movement between said cameras as a unit and said flat setting table whereby the particular portion of each flat support area which is viewed by its associated said camera may be changed by causing relative movement between said cameras as a unit and said flat setting table; and

an electric signal processor which so processes electric



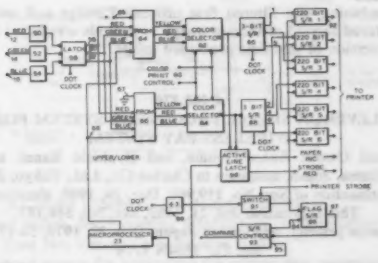
signals generated by said cameras that when said processed signals are applied to a color monitor, said color monitor displays the superimposed images of the flats which are located at said flat support areas.

4,463,374

COLOR PLOTTER INTERFACE AND CONTROL CIRCUIT

Leroy Thompson, Laguna Beach, Calif., assignor to Trilog, Inc., Irvine, Calif.

Filed Nov. 20, 1981, Ser. No. 323,318
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—78 **9 Claims**



1. In combination with a source of color video signals representing successive video pixels, each video pixel comprising a pattern of three dots which may respectively be of first, second, and third colors, apparatus for controlling a printer/plotter to produce printer/plotter pixels each to replicate a different one of said successive video pixels, each printer/plotter pixel comprising a pattern of four dots including upper left and right dots and lower left and right dots, said apparatus comprising:

sampling means for periodically sampling said color video signals to produce successive multibit codes, each code describing the color pattern of a succeeding video pixel;

memory means having a plurality of addressable locations, each location storing digital information identifying one of at least three different colors for each of upper left and right dots and lower left and right dots;

addressing means responsive to each multibit code produced by said sampling means for accessing the digital information stored in the memory means location identified by said multibit code; and

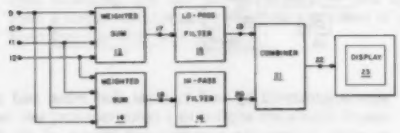
means responsive to said accessed digital information for assembling first and second dot row words to control said printer/plotter, said first dot row word being comprised of digital information identifying colors of upper dots associated with a plurality of printer/plotter pixels and said second dot row word being comprised of digital

information identifying colors of lower dots associated with said same plurality of printer/plotter pixels.

4,463,375
MULTIPLE-MEASUREMENT NOISE-REDUCING SYSTEM

Albert Macovski, Menlo Park, Calif., assignor to The Board of Trustees of the Leland Standford Junior University, Stanford, Calif.

Filed Sep. 7, 1982, Ser. No. 415,334
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 **41 Claims**



1. For use in an imaging system, a method for reducing the noise of a first processed image of an object representing a desired parameter derived from a plurality of measurements the steps of:

processing said plurality measurements to provide a second processed image having greater signal-to-noise ratio than said first processed image;

filtering said first processed image to reduce its noise;

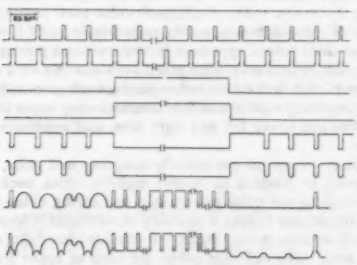
filtering said second processed image with a filter complementary to the filter used on said first processed image; and

combining said filtered first processed image and said filtered second processed image to provide a reduced noise version of said first processed image.

4,463,376
TELEVISION SIGNAL PROCESSING SYSTEM FOR A WIRELESS PAY SYSTEM

Hiroshi Osaka; Akira Honma, and Ryokichi Kanai, all of Saitama, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 219,960, Dec. 24, 1980, abandoned.
This application Jul. 21, 1983, Ser. No. 516,187
Claims priority, application Japan, Dec. 29, 1979, 54-173102
Int. Cl.³ H04N 7/16
U.S. Cl. 358—120 **3 Claims**



1. A television signal processing system which comprises:

a gate means having horizontal and vertical drive signals as inputs for producing as an output a pulse signal having only vertical blanking pulse intervals including horizontal blanking intervals;

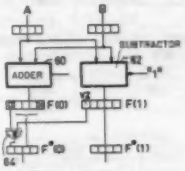
a filter means having said gate means pulse signal as an input for shaping the rising and falling portions of said pulse signal into a smooth wave form to produce a smoothed pulse signal; and

an adder means having as inputs said filter means smoothed pulse signal and a television signal so coded that synchronizing signal components thereof are inverted with reference to a pedestal portion thereof for adding said filter means smoothed pulse signal and said coded television signal, to produce a shifted television signal so that a level of at least a portion of the blanking interval of the television signal is shifted towards a white level of a video component and the wave forms of the rising and falling of the level shifting are smoothed.

4,463,377
ARRANGEMENT FOR STORING OR TRANSMITTING AND FOR RECOVERING PICTURE SIGNALS

Dietrich Meyer-Ebrecht, and Jens H. Christiansen, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1982, Ser. No. 421,610
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138816
Int. Cl.³ H04N 7/12
U.S. Cl. 358—133 **1 Claim**

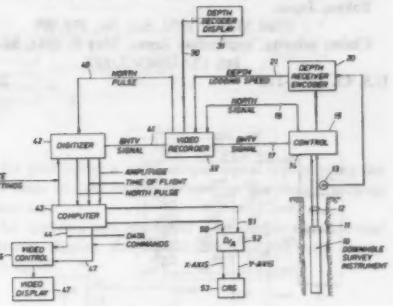


1. An arrangement for coding and decoding picture element signals comprising a coding arrangement, the picture element signals being obtained by line by line scanning of the picture elements of a picture, said picture element signals being transformed in a transformation arrangement for generating coefficient values which are quantized in a quantizing device, also comprising a decoding arrangement in which the quantized coefficients are reconverted in a retransformation arrangement into picture element signals which correspond to a very high extent to the original picture element signals, the transformation arrangement and the retransformation arrangement each being formed by a plurality of transformers T(i) of the order i, wherein i=1, 2, 3, . . . N and the transformer T(i) having i inputs and 2*i* outputs, the i inputs being connected to the i outputs of a preceding transformer T(i−1), each transformer being formed by i auxiliary transformers each having an input connected to the associated output of the preceding transformer T(i−1), an arithmetical unit having two inputs one of which is connected directly and the other one via a delay device to the input of the auxiliary transformer, the arithmetical unit having two outputs which represent two of the outputs of the transformers T(i), characterized in that each auxiliary transformer of the transformation arrangement comprises at least one additional logic circuit to which the carry bit of a first of the two output values and the sign bit of the second output value of the calculating unit are applied for generating an auxiliary bit which by way of most significant bit in the first output value replaces the carry bit while the least significant bit of this first output value and the sign bit of the second output value are suppressed and that each auxiliary transformer of the retransformation arrangement comprises a modifying circuit for adding a bit having the value "0" to the second output value in a bit position whose significance is higher than that of the most significant bit of the original second output value and for suppressing the least significant bit of the second output value thus modified and for applying this suppressed least significant bit together with the modified second output value to an adder device by way of carry bit.

4,463,378
BOREHOLE TELEVIEWER DISPLAY

Frederick H. K. Rambow, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 27, 1982, Ser. No. 402,456
Int. Cl.³ H04N 5/30
U.S. Cl. 358—112 12 Claims



1. A system for displaying data obtained from cyclicly acoustically scanning the wall of a borehole at a plurality of different depths, each scan of the borehole producing an orientation pulse related to a geographic direction and a series of signals, including a fire pulse and echo signals, whose amplitude is related to the condition of the borehole wall, said system comprising:

a digitizer circuit means, said digitizer circuit being responsive to the fire pulse of each series of signals for initiating a delay period timer and a time-of-flight timer, a peak detecting and hold circuit responsive to the end of the delay period for detecting the peak amplitude of the next occurring echo signal, said time-of-flight timer being stopped upon detection of said peak amplitude to provide a time-of-flight signal;

a computer, said digitizer circuit being coupled to said computer, said computer assigning a shade of gray to each digital signal based on the amplitude represented thereby and arranging of said series of digital signals as a single horizontal line in a television format with each line being initiated by said orientation pulse, said computer storing sufficient series of said signals to form a complete television display; and

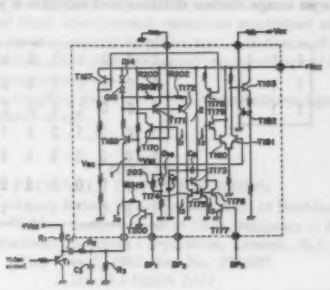
a television monitor, said computer being coupled to said monitor whereby said monitor displays said series of signals as a continuous display.

4,463,379
SYNCHRO SEPARATION CIRCUIT

Nobukazu Hosoya, 580-7, Hidehara, Heguri-cho, Ikoma-gun, Nara 636, Japan

PCT No. PCT/JP81/00223, 371 Date Apr. 20, 1982, 102(e) Date Apr. 20, 1982, PCT Pub. No. WO82/00933, PCT Pub. Date Mar. 18, 1982
PCT Filed Sep. 8, 1981, Ser. No. 373,510
Claims priority, application Japan, Sep. 9, 1980, 55-125656
Int. Cl.³ H04N 5/08
U.S. Cl. 358—154 4 Claims

1. A synchro separation circuit characterized in that it comprises an amplitude separation circuit for separating a composite synchronizing signal from a composite video signal, a frequency separation circuit for separating a vertical synchronizing signal from said composite synchronizing signal, a capacitor and its discharge resistor means connected between the emitter of an input transistor of said amplitude separation circuit, which is operable as a base-grounded transistor adapted to be cut off during the video signal period of said composite video signal and an emitter of an emitter-follower transistor supplying the composite video signal to said input transistor, means for charging said capacitor upon conduction of said input transistor, and a discharge circuit connected in

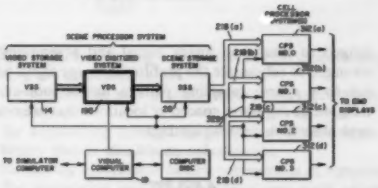


parallel to said discharge resistor means for operating only during at least the vertical synchronizing signal period of the composite video signal.

4,463,380
IMAGE PROCESSING SYSTEM

John T. Hooks, Jr., Dallas, Tex., assignor to Vought Corporation, Dallas, Tex.

Filed Sep. 25, 1981, Ser. No. 305,741
Int. Cl.³ H04N 7/18
U.S. Cl. 358—160 46 Claims



1. An image processing apparatus, comprising:

first means, for recording information corresponding to at least two views of a geometric system;

second means, for integrating the information corresponding to at least two views and producing a data segment corresponding to a single view of the geometric system containing the information corresponding to the at least two views; and

third means, for processing the data segment produced by the second means to provide information for simulating a third view of the geometric system.

4,463,381
IMAGE PROCESSING APPARATUS INCLUDING A PARTITIONED LOW PASS CHANNEL

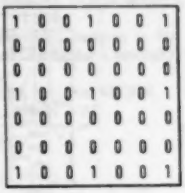
Philip G. Powell, Pinner, and Richard A. Sharman, Houghton Regis, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

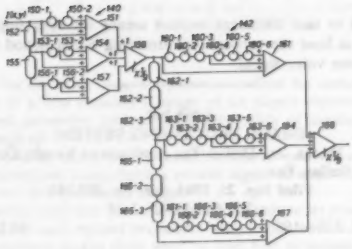
PCT No. PCT/GB81/00073, 371 Date Nov. 30, 1981, 102(e) Date Nov. 30, 1981, PCT Pub. No. WO81/03095, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 16, 1980, Ser. No. 328,544
Claims priority, application United Kingdom, Apr. 16, 1980, 8012513; May 12, 1980, 8015710
Int. Cl.³ H04N 5/14, 5/21
U.S. Cl. 358—166 8 Claims

1. Electronic image processing apparatus in which an image signal representing a predetermined array of picture elements, or pels, is applied to a high pass filter acting as an image feature

detector whose signal output is added to the output of a low pass filter to provide a feature-enhanced output signal,

characterised in that the low pass filter is also arranged to act as an image feature detector and includes a prefilter arranged to filter said image signal and a sampling filter arranged to subsample the prefiltered image signal according to a sparse sampling pattern having non-zero pel weightings regularly spaced at locations that are nonadjacent other non-zero weightings.





4,463,382

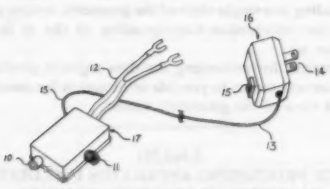
AUTOMATIC, REMOTE SIGNAL SOURCE SELECTOR

Bruno Pellegrini, 40 Burtis Ave., Yonkers, N.Y. 10701, and David E. Arnold, 13 Blauvelt St., Nanuet, N.Y. 10954

Filed Mar. 15, 1982, Ser. No. 358,205

Int. Cl.³ H04N *5/44*

U.S. Cl. 358—181 **4 Claims**



1. A switching device for automatically selecting from a plurality of signals supplied by a plurality of signal sources, which signal is to be supplied to a display device, comprising:

a plug for mating with an AC power outlet and a receptacle for accepting the power plug of a first signal source and supplying power to the first signal source;

a pair of input signal ports for receiving signals from the first signal source and a second signal source;

an output for supplying a selected signal to the display device;

a switch for supplying the signal from one of the input ports to the output;

where the signal supplied to the output port by the switch is selected based on the operative state of the first signal source.

4,463,383

IMAGE PICKUP APPARATUS

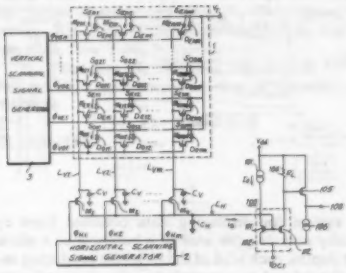
Mitsuo Soneda, Zama; Takashi Noguchi, Atsugi, and Takaji Ohtsu, Hadano, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,109

Claims priority, application Japan, May 9, 1981, 56-69786

Int. Cl.³ H04N *5/197*

U.S. Cl. 358—212 **24 Claims**



1. Image pickup apparatus comprising a plurality of picture element units each formed of a photosensitive member generating a quantum of electrical charge depending on the amount of light falling thereon, and an electrically controlled gating circuit for transmitting the generated amount of charge in response to scanning pulses applied thereto, said picture element units being arranged in a two-dimensional array of horizontal rows and vertical columns; scanning circuit means for sequentially providing said scanning pulses to the gating circuits of the respective picture element units; and output circuit means coupled to receive the electrical charges in sequence, from said picture element units to produce an output video signal, wherein said output circuit means includes a current mirror circuit formed of first and second transistors each having first and second current-carrying electrodes and a control electrode, with the first current-carrying electrodes thereof being coupled together to a source of reference potential and with their control electrodes being connected to one another, a current source coupled to the second current-carrying electrode of said first transistor, and an output load coupled between said second current-carrying electrode of said second transistor and a second source of reference potential, with said generated electrical charge being applied to the second current-carrying electrode of said first transistor and said output video signal being provided at the second current-carrying electrode of said second transistor.

4,463,384

TELEVISION CAMERA

Kenji Fujikawa, Yokohama, and Ryusho Hirose, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 216,293, Dec. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 099,890, Dec. 3, 1979, abandoned. This application Feb. 18, 1983, Ser. No. 467,594

Claims priority, application Japan, Dec. 11, 1978, 53-153374

Int. Cl.³ H04N *9/28*

U.S. Cl. 358—227 **3 Claims**

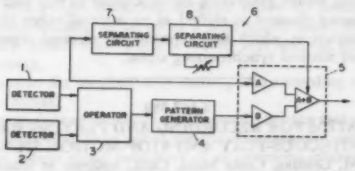
1. A television camera comprising:

an image pick-up device for providing a video signal, said device having an image pick-up surface;

an object lens for forming an image of an object on the image pick-up surface, and means for adjusting said object lens to

provide the image in a focused state on the image pick-up device;

an electronic display device for displaying the image video signal;



means for generating a video output signal representing the focus state of said image formed on the image pick-up surface; and

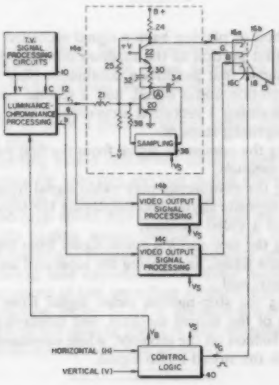
means for applying said generated video output signal to said electronic display device for display with said image video signal.

4,463,385

KINESCOPE BLACK LEVEL CURRENT SENSING APPARATUS

Robert P. Parker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,422
Int. Cl.³ H04N *5/68, 3/24, 9/20, 3/24*
U.S. Cl. 358—242 **9 Claims**



1. In a video signal processing system including an image reproducing device responsive to video signals supplied via a video signal path to an intensity control electrode thereof, apparatus comprising:

driver amplifier means included in said video path and having a first terminal for receiving video signals to be amplified, a second terminal coupled to said intensity control electrode for supplying amplified video signals thereto, and a third terminal coupled to a reference potential and with said second terminal defining a main current conduction path of said amplifier means;

feedback means coupled from said second terminal to said first terminal of said amplifier means;

bias control means, operative during video signal image blanking intervals and responsive to a signal having a magnitude representative of black level current conducted by said intensity control electrode during image blanking intervals, for providing a control voltage derived from said representative signal to said video signal path for automatically controlling the bias of said image reproducing device to maintain a desired level of black current;

sensing means comprising a sensing impedance for receiving, via said feedback means, current variations representative of black level current variations manifested at said second terminal of said amplifier means so that said sensing impedance develops said signal representative of black current variations; and

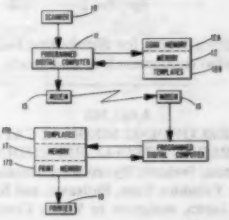
means for coupling said developed representative signal to said control means.

4,463,386

FACSIMILE DATA REDUCTION

Robert D. Goddard; Robert R. Schomburg, both of Boulder, and Wayne L. Wohler, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1982, Ser. No. 373,937
Int. Cl.³ H04N *1/41*
U.S. Cl. 358—261 **9 Claims**



1. Apparatus for encoding a two-dimensional graphic image comprising the combination of:

means for converting said graphic image to a representative binary matrix;

means for segmenting contiguous groups of like elements in said binary matrix into binary submatrices;

means for storing identifiable binary submatrices as templates;

means for comparing said binary submatrices with selected templates and for supplying a match signal when a binary submatrix substantially matches one of said selected templates;

means for replacing substantially matched binary submatrices in said binary matrix with blank submatrices in response to said match signal;

means for encoding said binary matrix as a data stream; and

means for inserting in said data stream identifying data representative of a substantially matched selected template at a point in said data stream relative to the location of the corresponding substantially matched binary submatrix.

4,463,387

DIGITAL VIDEO DATA RECORDING APPARATUS

Yoshitaka Hashimoto, Chofu; Kaichi Yamamoto, Zama, and Norihisa Shirota, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 16, 1981, Ser. No. 254,741
Claims priority, application Japan, Apr. 18, 1980, 55-59136
Int. Cl.³ H04N *9/491, 5/78;* G11B *5/02, 5/09*
U.S. Cl. 358—310 **11 Claims**

1. Digitized video data recording apparatus comprising:

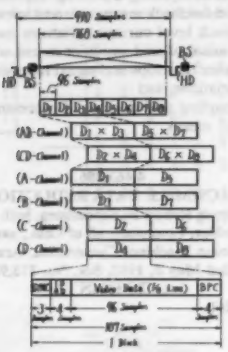
a tape guide drum about the periphery of which a magnetic tape is transported at a predetermined wrap angle;

a plurality of rotary magnetic heads associated with said guide drum for scanning respective parallel slant tracks on said magnetic tape;

means for providing a digitized video signal comprised of horizontal scanning intervals;

signal processing means for arranging the digitized video data of each horizontal scanning interval into a number of

data blocks, which number is twice the number of said heads; and



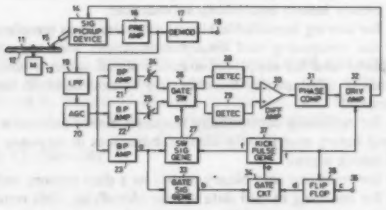
signal distributing means for distributing two blocks of the digitized video data to each of said heads.

4,463,388

ROTARY RECORDING MEDIUM CAPABLE OF PERFORMING SPECIAL REPRODUCTION

Hiroyuki Sugiyama, Isehara; Ryozo Abe; Masaki Sakurai, both of Yokohama; Yahuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 12, 1982, Ser. No. 338,857
Claims priority, application Japan, Jan. 14, 1981, 56-4418
Int. Cl.³ H04N 5/76
U.S. Cl. 358—342 **5 Claims**



1. A reproducing apparatus for reproducing a rotary recording medium by use of a reproducing element, said rotary recording medium being recorded with a main information signal on a spiral main track, first and second reference signals for tracking control on sub tracks provided at substantially center parts between center lines of each track adjacent to said main track so that the sides on which the first and second reference signals are recorded with respect to said main track alternately changes over for each track turn of said main track, and a third reference signal for tracking control on said main or sub track at positions corresponding to recorded positions whereat said first and second reference signals are changed over, said third reference signal being recorded in an interval corresponding to the interval of a vertical synchronizing signal within a vertical blanking period of said main information signal for each of said track turns, said first and second reference signals being recorded within an interval excluding the interval corresponding to that of said vertical synchronizing signal, said reproducing apparatus comprising:

tracking control means for obtaining a tracking control signal from the first and second reference signals reproduced by said reproducing element, to perform a tracking control operation of said reproducing element with respect to said main track; and

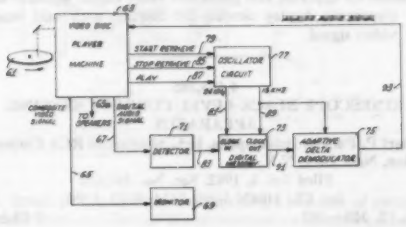
kick pulse generating means for generating a kick pulse for shifting said reproducing element to an adjacent track during a special reproduction mode, said kick pulse generating means generating the kick pulse so that said reproducing element is shifted at an interval other than the interval in which said reproducing element reproduces said vertical synchronizing signal.

4,463,389

SYSTEM FOR RECORDING AND PLAYING BACK CONTINUOUS-PLAY AND STOP-MOTION SIGNALS

Scott M. Golding, Costa Mesa, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Oct. 31, 1980, Ser. No. 202,840
Int. Cl.³ H04N 5/76
U.S. Cl. 358—343 **8 Claims**



1. A method of playing back a signal recorded on a record medium, a first portion of the medium containing a recorded composite signal that includes a continuous-play video signal and a stop-motion audio signal, and a second portion of the medium containing a recorded stop-motion video signal, the method comprising steps of:

recovering the composite signal from the first portion of the record medium;

separating the continuous-play video signal from the recovered composite signal, and displaying the separated video signal on a video monitor;

separating the stop-motion audio signal from the recovered composite signal, and storing the separated audio signal in a memory; and

recovering the stop-motion video signal from the second portion of the record medium, and displaying it in a repeated fashion on the monitor, while simultaneously playing back the stored audio signal.

4,463,390

SPECIAL EFFECTS NOISE REDUCTION IN A ROTARY HEAD REPRODUCTION APPARATUS

Yoshio Koga, and Takafumi Inadomi, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 368,086
Claims priority, application Japan, Apr. 30, 1981, 56-67175
Int. Cl.³ H04N 5/783
U.S. Cl. 360—10.3 **11 Claims**

1. A magnetic video reproducing apparatus employing a rotational two-head system including two video heads provided on the circumference of a rotational drum spaced apart by 180° from each other, a helical scan system for causing a recording medium to travel obliquely with respect to the rotational direction of said video heads, and an azimuth system in which said two video heads each having a gap are provided such that gaps of said two video heads extend with the angles intersecting each other, said apparatus being used for reproducing a video signal recorded on a recording medium and

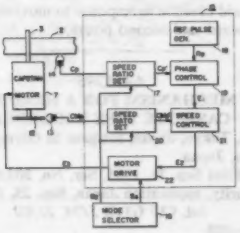
having a video track pitch larger than the width of said video head and further having a control signal for use in control, said magnetic video reproducing apparatus having a plurality of modes of operation including an ordinary reproduction mode for causing said recording medium to travel at an ordinary speed and a high speed reproduction mode for causing said recording medium to travel at a high speed faster than said ordinary speed, said magnetic video reproducing apparatus comprising,

a capstan for mechanically causing said recording medium to travel,

capstan driving means for mechanically driving said capstan,

driving means state signal generating means for generating an output signal indicative of an operating characteristic of said capstan driving means and of travel characteristics of said recording medium,

control signal extracting means for extracting a control signal recorded in said recording medium and for generating an output signal responsive thereto,



capstan servo circuit means responsive to the output from said driving means state signal generating means and to the output signal from said control signal extracting means for controlling the travel characteristics of said recording medium to have a predetermined speed and a predetermined phase,

mode selecting means connected to said capstan servo circuit means for selecting any one of said plurality of modes of operation including said ordinary reproduction mode and said high speed reproduction mode, and

speed ratio setting means coupled to said capstan servo circuit means and responsive to said mode selecting means for causing said capstan servo circuit means to set the driving speed of said recording medium in said high speed reproduction mode to be a predetermined odd integer multiple of the driving speed of said recording medium in said ordinary reproduction mode.

4,463,391

VIDEO TAPE EDITOR

Masayuki Takano, Tokyo; Masaaki Sakai, Kawasaki, and Masaharu Enoki, Sagamihara, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,767

Claims priority, application Japan, Oct. 3, 1980, 55-139203

Int. Cl.³ H04N *5/782*; G11B *15/18*

U.S. Cl. 360—14.2 **3 Claims**

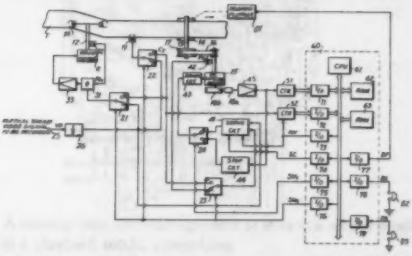
1. A method of editing a video signal using video tape recording and reproducing apparatus in which the video signal is recorded on parallel tracks disposed at an angle to the direction of advancement of the tape and control signals are recorded in a track parallel to said direction of advancement; in which a rotary recording and playback head moves across said tape to define a head trace parallel to said tracks when the tape is advanced at normal speed and disposed at an angle to said tracks when said tape is held stationary; in which a capstan is included for pressing against said tape for advancing same and for producing an oscillating signal each time said tape is advanced a predetermined amount; and in which a new video signal is recorded following an existing video signal previously recorded on the tape, the method comprising the steps of:

stopping the tape at a point at which recording of the new video signal is to commence;

running said tape in the direction opposite to the direction of advancement thereof while reproducing said control signals therefrom;

counting occurrences of said oscillating signal;

stopping said tape at a predetermined position determined by counting a predetermined number of occurrences of said oscillating signal beyond the occurrence of a predetermined pulse provided by picking up said control signal at which said trace of the head is substantially centered in respect to one of said tracks at a midpoint along the latter so that the existing video signal previously recorded in said one track can be reproduced without objectionable noise notwithstanding that said trace of said head does not



completely coincide with said one track, said step of stopping said tape at the predetermined position including changing the video tape recording and reproducing apparatus over from a reverse mode to a forward mode when a predetermined number of pulses produced by picking up said control signal have been counted, while continuing to count said pulses during any tape overrun, and advancing said tape to said predetermined position to compensate for said tape overrun, said step of advancing said tape including the step of running said tape forward at a speed slower than said normal speed;

running said tape forward, after the step of stopping the tape at said predetermined position, at said normal speed while measuring the advancement of said tape by counting said pulses as said tape is advanced; and then

commencing the recording of said new video signal at a predetermined distance from the point where said tape had been stopped.

4,463,392

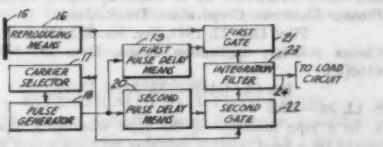
RECORDING SYSTEM WITH NOISE REDUCTION

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec H3H 1T1, and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec H3R 1K3, both of Canada

Filed Apr. 13, 1981, Ser. No. 253,204

Int. Cl.³ G11B *5/04*

U.S. Cl. 360—30 **9 Claims**



1. Reproducing apparatus, in which reproducing means produces an input wave from an input recording medium, said input wave being a carrier of substantially constant amplitude and substantially constant frequency, with a band-limited sig-

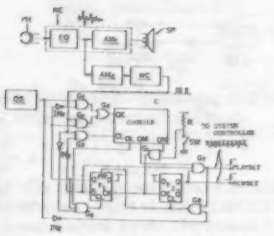
nal which amplitude modulates said carrier on a double-sideband basis, together with noise superimposed on said modulated carrier in the frequency band of said modulated carrier, and by sampling means timed from said carrier, and reconstruction means, delivers a carrier modulated by said signal to a load circuit, substantially free from said superimposed noise.

4,463,393

REPEAT PLAYBACK DEVICE FOR TAPE RECORDER

Yoshiharu Ueki, and Shouzaburou Sakaguchi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,691
Claims priority, application Japan, Feb. 7, 1981, 56-16448[U]
Int. Cl.³ G11B *15/48*
U.S. Cl. 360—74.1 **10 Claims**



1. In a repeat playback device for use in a tape recorder, the playback device being of the type which places the recorder in a rewinding mode upon the detection of a blank tape segment following the end of a music segment in a playing mode, and which at the end of the rewinding mode places the recorder in a playing mode to repeat the playback of the music segment, the improvement, which prevents placing the recorder in the rewinding mode when a blank tape segment occurs prior to the beginning of a music segment after the recorder has been placed in a playing mode following a rewinding mode, comprising:

tape running state control circuit means for switching an operational mode from a rewinding mode to a play mode after a rewinding operation has been accomplished;

music beginning detecting circuit means for detecting the beginning of a segment of music recorded on a magnetic tape;

and

control circuit means for setting said music beginning detecting circuit means in a state to be ready for detecting the beginning of a subsequent segment of music in response to said music beginning detecting circuit means detecting the start of a segment of music.

4,463,394

TAPE RETAINING MECHANISM

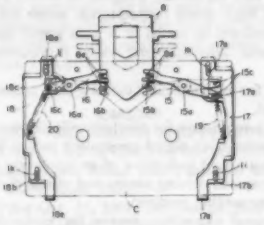
Masahiro Komatsubara; Tetsuro Kamimura; Takagi Inanaga, and Akira Takahashi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,346
Claims priority, application Japan, Dec. 23, 1980, 55-184160[U]
Int. Cl.³ G11B *5/52, 5/54, 15/66*
U.S. Cl. 360—96.5 **7 Claims**

1. In a tape machine of the type wherein a tape head mounted on a head stand is movable between a first position out of contact with a cassette tape and a second position in which said head contacts said cassette tape, said cassette tape being wound in a cassette having a front surface through which said tape is exposed to said head and also having a rear surface, a tape retaining mechanism comprising:

at least one cassette retaining plate for engaging said rear surface of said cassette; and

moving means for moving said retaining plate in association



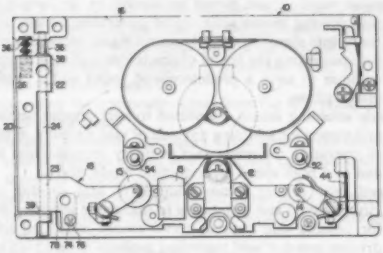
with movement of said head stand for engaging and securing said cassette, wherein said at least one retaining plate secures said cassette in response to movement of said head stand toward said second position.

4,463,395

SUPPORT MECHANISM FOR A HEAD LEVER OF A CASSETTE TAPE RECORDER

Akira Osanai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 303,920
Claims priority, application Japan, Sep. 25, 1980, 55-133163
Int. Cl.³ G11B *5/54, 21/02*
U.S. Cl. 360—105 **5 Claims**



1. A head lever supporting mechanism for a tape recorder, which has a base board and a head lever slidable relative to the base board in a predetermined sliding direction, comprising:

a first guide bar extending in the sliding direction of the head lever for supporting one of two opposite ends of the head lever for sliding movement in the axial direction of the first guide bar;

support means for supporting the first guide bar above the base board;

a second guide bar fixed to a selected one of the other end of the head lever and the base board, said second guide bar extending substantially parallel to the first guide bar;

a forked portion formed on that one of the other end of the head lever and the base board to which the second guide bar is not fixed, said forked portion engaging the second guide bar for movement relative to the second guide bar in the axial direction of the first guide bar and in a direction perpendicular to the first guide bar and transversely of the first and the second guide bars in a plane extending between the first and second guide bars;

said forked portion comprising a contacting face touching the circumference of the second guide bar, and a plate spring for resiliently urging the second guide bar on its circumference against the contacting face of the forked

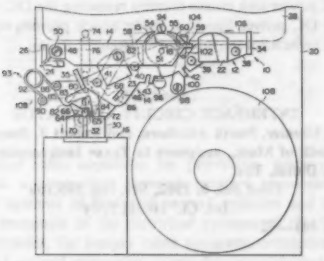
portion, such that the second guide bar is resiliently sandwiched between the contacting face and the plate spring.

4,463,396

METHOD FOR SELECTING ANY ONE OF HEADS OF A CASSETTE TAPE RECORDER OF AUTOMATIC REVERSE TYPE, AND A HEAD SELECTION MECHANISM FOR ITS PRACTICE

Akira Osanai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1981, Ser. No. 326,512
Claims priority, application Japan, Dec. 15, 1980, 55-176876
Int. Cl.³ G11B *5/54*
U.S. Cl. 360—105 **11 Claims**



1. A head selection mechanism for a cassette tape recorder of the automatic reverse type which includes a head lever for supporting at least one magnetic head on each side adjacent to a center of pivotal movement wherein the head lever is pivotally mounted on a base plate; a pinch roller lever for supporting a pinch roller and which lever is pivotally mounted on said base plate; and pinch roller lever biasing means for biasing said pinch roller lever in the direction toward a capstan shaft, said mechanism comprising:

a bias mechanism for selectively biasing said head lever about said center of pivotal movement in a selected one of a clockwise and a counterclockwise direction;

a solenoid including a plunger biased in an original position wherein said plunger is pulled against a biasing force when said solenoid is excited, said plunger being connected to move with said head lever to change the biasing direction of said bias mechanism and to pivot said head lever, and being drivingly connected to move with said pinch roller lever to pivot said pinch roller lever against the biasing force of the biasing means associated with said pinch roller lever;

stop means for holding said pinch roller lever at a neutral position against the biasing force of the pinch roller lever biasing means after said pinch roller lever is pivoted by said plunger, wherein said stop means includes a projecting member which extends downward from said pinch roller lever, and a flexible elastic member including an engaging portion for restraining movement of said projecting member, and a contact portion located within the path of movement of a cassette holder from an initial position to a position for a play mode, for releasing said projecting member from said engaging portion by contacting with one of said cassette holder and a tape cassette within said cassette holder wherein said elastic member is deformed in shape; and

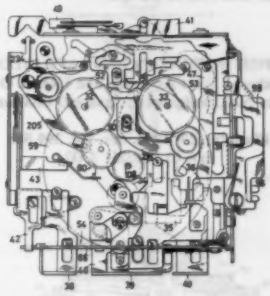
abutment means for preventing pivotal movement of said lever in response to said bias mechanism by bringing said head lever into contact with said pinch roller lever at said neutral position.

4,463,397

CASSETTE TAPE RECORDER

Kazuyasu Motoyama, and Toshikazu Kato, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 124,515, Feb. 25, 1980. This application Oct. 26, 1981, Ser. No. 314,615
Claims priority, application Japan, Mar. 2, 1979, 54-26468[U]
The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.
Int. Cl.³ G11B *15/18*
U.S. Cl. 360—137 **11 Claims**



1. A cassette tape recorder operable at least in a record mode and in a playback mode, comprising:

playback, and stop button plates urged to their respective original positions by the biasing forces of first, and second biasing means, said playback and stop button plates being non-rockable and slidably mounted in parallel on a base plate so as to be slidable relative to said base plate and in parallel to said base plate, said playback and stop button plates being slidable only within a region defined by said base plate;

a lock mechanism including a seesaw lever rockably mounted on said base plate within a plane crossing at substantially a right angle with the sliding direction of said playback button plate, said seesaw lever having at one end portion thereof a lock means capable of engaging said playback button plate, said seesaw lever being rockable in one direction to cause said lock means to engage said playback button plate when said playback button plate is pressed to an operating position from its original position against the biasing force of the first biasing means, whereby said playback button plate is locked at said operating position and the other end portion of said seesaw lever is moved to such a position that said other end portion of said seesaw lever can engage said stop button plate; and

an ejecting plate detecting the difference between the displacement of said seesaw lever in the playback or recording mode and the displacement of said seesaw lever in the stop mode, and slidingly engaged with said stop button plate when said stop button plate is pressed against the biasing force of the second biasing means in the stop mode.

4,463,398

INTRINSICALLY SAFE PILOT LIGHT

James M. Boozer, Asheville; Terry E. Franks, Leicester, and Richard C. Rothweiler, Asheville, all of N.C., assignors to Square D Company, Palatine, Ill.

Filed Jul. 19, 1982, Ser. No. 399,533
Int. Cl.³ H02H *7/00*
U.S. Cl. 361—1 **46 Claims**

1. An intrinsically safe pilot light assembly comprising:

a base adapted to extend through an opening in a wall, said wall having a side extending in a hazardous area, and

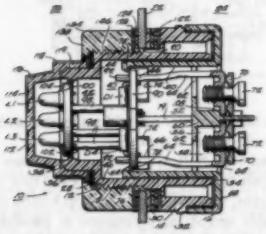
a cluster of at least three contiguous light emitting semiconductor devices positioned by the base and visible from the hazardous area side of the wall.

4,463,399

CIRCUIT FOR INTRINSICALLY SAFE PILOT LIGHT

David R. Matherly, West Asheville, and Horace O. Sue, Asheville, both of N.C., assignors to Square D Company, Palatine, Ill.

Filed Jul. 19, 1982, Ser. No. 399,565
Int. Cl.³ H02H 7/00
U.S. Cl. 361—1 **9 Claims**



1. A circuit for an intrinsically safe pilot light comprising:
a plurality of light emitting diodes connected in series,
a pair of terminals connected to an intrinsically safe electric source,
a full wave bridge rectifier connected in a circuit between the terminals and the series connected diodes for supplying the diodes with controlled polarity direct current regardless of the polarity of the source,
and a current regulator connected in the circuit for maintaining constant the current supplied to the diodes upon failure of any of the diodes and to maintain the current at a value to optimize brightness of the diodes.

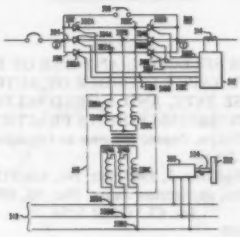
4,463,400

DC STATIC SWITCH WITH PHASE COMMUTATION

Derek A. Paice, and Peter Wood, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1983, Ser. No. 457,773
Int. Cl.³ H02H 7/22
U.S. Cl. 361—5 **14 Claims**

1. An electrical current interruption apparatus for a DC power line, comprising:
switch means disposed in the DC power line for being opened to space one portion of the DC power line from another portion thereof;
converter means connected in the DC power line for converting a portion of DC current flowing in the DC power line into AC current upon command, the converter means having an AC terminal through which the AC current flows;
control means interconnected with the converter means for supplying the command to the converter means; and
AC power sink means interconnected with the AC terminal of the converter means for absorbing the AC current, the switch means, the converter means, the control means and the AC power sink means cooperating such that upon the command a portion of the DC current is converted to AC current and conducted through the AC terminal into the



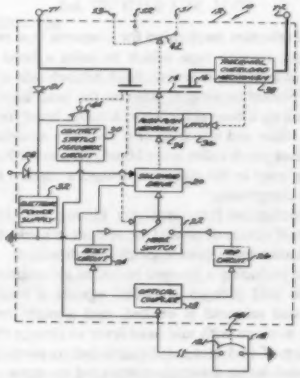
AC power sink means thereby reducing the DC current in the DC power line to a value which permits opening of the switch means without substantial arcing.

4,463,401

INTERFACE CIRCUIT APPARATUS

Aime J. Grenier, North Attleboro, and Robert J. Bowen, Taunton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1982, Ser. No. 395,169
Int. Cl.³ H02H 5/04
U.S. Cl. 361—72 **8 Claims**



1. An interface circuit for providing logic and drive power for a remote controlled circuit breaker from a power source regardless of whether the power source is a direct current source or an alternating current source, the circuit breaker having first and second load contact assembly means, the first load contact assembly means being movable between contacts reset engaged and contacts tripped disengaged positions with the second load contact assembly means, a solenoid for moving said first contact assembly means and a control circuit for providing logic for energizing the solenoid, the interface circuit comprising a main power terminal, a rectifying diode connected to the terminal, a relay coil circuit including a relay coil, first ballast resistance means, normally closed relay contacts coupled across the first ballast resistance means, the rectifying diode connected to one side of the relay coil circuit, one side of the relay contacts and one side of the first ballast resistance means, second ballast resistance means connected to a second side of the relay contacts and a second side of the coil circuit, the relay coil adapted to open the relay contacts when a selected voltage level is provided at the main power terminal, current flowing through the first ballast resistance means for

a-c or the relay contacts for d-c being used for drive power for the solenoid and current flowing through the coil circuit for a-c or the second ballast resistance means for d-c used for the control circuit.

4,463,402

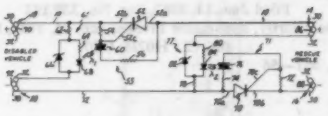
SAFETY JUMPER CABLE APPARATUS

Gerald G. Cottrell, R.R. 4, Box 55, Osseo, Wis. 54758

Continuation of Ser. No. 162,403, Jun. 24, 1980, abandoned. This application Mar. 22, 1983, Ser. No. 476,046

Int. Cl.³ H02H 7/18

U.S. Cl. 361—77 12 Claims



1. Jumper cable apparatus for providing, when properly connected, a connection between positive terminals of the electrical systems of first and second vehicles and between negative terminals of the electrical systems of the first and second vehicles, the jumper cable apparatus comprising:

first and second connector means for user-selected removable connection to the positive and negative electrical terminals, respectively, of the electrical system of the first vehicle when properly connected;

third and fourth connector means for user-selected removable connection to the positive and negative electrical terminals, respectively, of the electrical system of the second vehicle when properly connected;

first cable means for providing a first current path between the first and third connector means;

second cable means for providing a second current path between the second and fourth connector means; and

control means for preventing current flow in the first and second current paths unless (a) a first voltage between the third and fourth connector means has a polarity in which the third connector means is more positive than the fourth connector means and a magnitude greater than a predetermined threshold level, and (b) a second voltage between the first connector means and one other of the second, third and fourth connector means has a predetermined polarity in which the first connector means is more positive than the one other of the second, third and fourth connector means and a magnitude greater than a predetermined threshold level, thus indicating that the first, second, third and fourth connectors are all connected properly, wherein the control means comprises:

first switch means connected in the first current path and having a conductive state which permits current flow through the first path and a nonconductive state which blocks current flow through the first path;

first switch control means for controlling the state of the first switch means as a function of the first and second voltages;

second switch means connected in the second current path and having a conductive state which permits current flow through the second path and a nonconductive state which blocks current flow through the second path; and

second switch control means for controlling the state of the second switch means as a function of the first and second voltages.

4,463,403

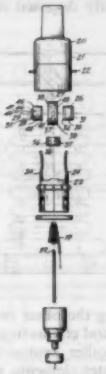
PLUG TYPE GAS TUBE REPLACEMENT MODULE

Michael Fasano, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,209

Int. Cl.³ H02H 9/06

U.S. Cl. 361—124 1 Claim



1. In a telephone protector module of a type including a generally cylindrical body having a principal axis, and a coaxially disposed conductive metallic cage having a pair of resilient oppositely disposed fingers supporting an air gap means, improved air gap forming means comprising: a gas tube element having first and second conductive end surfaces, a conductive washer having a peripheral surface, first and second end surfaces, said first end surface having means for engaging an end surface of said gas tube element, an insulative washer having first and second ends, a through bore communicating with said ends, and a conductive sleeve disposed within said bore, a first end of said sleeve overlying said first end of said insulative washer, and contacting said second end of said conductive washer, a second end of said sleeve being positioned inwardly of said second end of said insulative washer; said gas tube element, conductive washer and insulative washer being positioned coaxially with respect to each other, and transversely with respect to said principal axis of said cylindrical body between said spring fingers; said peripheral surface of said conductive washer contacting a terminal communicating with an engaged protector block, said gas tube element forming a primary air gap means with one of said spring fingers, said insulative washer and sleeve forming a secondary air gap means with the other of said spring fingers.

4,463,404

SURGE VOLTAGE ARRESTER WITH SHIELDING BODIES ENCLOSING A COLUMN OF ARRESTER ELEMENTS

Mohamed A. Hassan, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,247

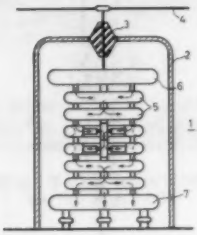
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3112477

Int. Cl.³ H02H 9/06

U.S. Cl. 361—128 2 Claims

1. An overvoltage arrester comprising a plurality of shielding elements each having an opening therethrough, the shielding elements being substantially superposed so that the openings are substantially aligned, a plurality of electrically interconnected arrester elements disposed in the substantially aligned openings, means associated with each of at least two adjacent shielding elements for fastening at least one arrester

element to each of the two shielding elements and a plurality of support members disposed between adjacent shielding elements at the periphery of the openings in the shielding elements for supporting the shielding elements, the shielding elements providing support for the arrester elements fastened thereto, the arrester elements within a shielding element arranged in a cross- or star-shape manner with one end of each arrester element fastened to the shielding element and a connecting member centrally disposed relative to the shielding



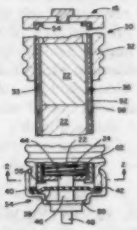
elements interconnecting the other ends of the individual arrester elements, the central connecting member being adapted to be connected to another central connecting member of adjacent groups of arrester elements, a first group of the support members cooperating with central connecting members associated with adjacent shielding elements to provide different current flow directions in arrester elements of adjacent shield elements, a second group of support members comprising insulating support members and a third group of support members comprising voltage controlling elements.

4,463,405

FAIL SAFE SURGE ARRESTER

Robert E. Koch, and Earl W. Stetson, both of Pittsfield, Mass., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 19, 1981, Ser. No. 235,906
Int. Cl.³ H02H *9/04*
U.S. Cl. 361—135 **3 Claims**



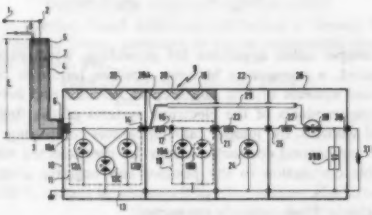
1. A surge arrester comprising: an outer elongated housing of relatively rigid electrically insulating material defining a longitudinal chamber from one end of the housing to an opposite end thereof; first and second chamber closing means respectively including electrical terminals located at said chamber ends; means including a plurality of arrester components in series relationship with one another within said housing chamber for providing a high or low electrical impedance path between said terminals depending upon the voltage across the latter; a liner between said arrester components and the inner surface of said housing; sealing means forming part of at least one of said chamber closing means for opening an associated end of said chamber to the ambient surrounding to thereby vent said chamber in response to a predetermined increase in pressure within the latter; and component retaining means located at said associated chamber end for preventing said components from escaping out the latter during venting of said chamber, said component retaining means including an end section of said liner located at said associated chamber end adjacent one end of said components, said liner end section including a plurality of openings therethrough, and a relatively rigid web-like member including a main body sufficiently open so as not to inhibit venting of said chamber and outward projections extending into said end section openings for securing the main body of said web-like member in place.

4,463,406

APPARATUS FOR PROTECTING AN ELECTRIC LINE AGAINST DISTURBANCES WITH VERY STEEP WAVE FRONTS

Michel Sirel, Paris, France, assignor to Les Cables De Lyon, Clichy, France

Filed Jan. 13, 1982, Ser. No. 339,192
Claims priority, application France, Jan. 14, 1981, 81 00538
Int. Cl.³ H02H *3/20*
U.S. Cl. 361—56 **8 Claims**



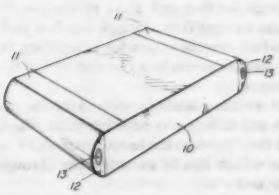
1. An apparatus for protecting a low-tension electric line against disturbances with very steep wave fronts, said apparatus comprising a box with a plurality of compartments connected in series, a long electric conductor extending through said compartments and being insulated therefrom, said compartments being equipped with limiter units connected to said conductor and said box being disposed upstream from the line which is to be protected, the improvement wherein said apparatus further includes, upstream from the box, said long electric conductor surrounded by a metal tube which is closed at its ends by insulating windows and separated from said metal tube by a solid or gaseous insulant.

4,463,407

SURFACE MOUNTED ELECTRONIC COMPONENTS HAVING PRE-APPLIED SOLDER

Jean P. Berger, Stittsville, and Carlyle W. Crothers, Kinburn, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 27, 1982, Ser. No. 424,088
Int. Cl.³ H01G *1/14*
U.S. Cl. 361—306 **2 Claims**



1. A surface mounting electronic component for mounting

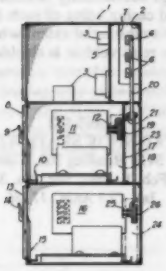
on a printed circuit board, said component of rectangular form and having opposite ends coated with a metal to provide a solderable contact area at each end, and a preformed layer of flux cored solder attached on the end surface at said opposite ends.

4,463,408

TWO-HIGH MOTOR CONTROL CENTER WITH STAGGERED CUBICLES

John D. Kleinecke; Thomas R. Little, and Samir F. Farag, all of Wichita Falls, Tex., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 28, 1982, Ser. No. 373,091
Int. Cl.³ H02B 1/04
U.S. Cl. 361—342 **2 Claims**



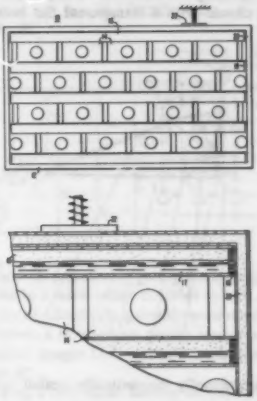
1. A high voltage motor control center, comprising;
a metal cabinet having three vertically disposed cubicles of uniform depth therein;
a first, upper cubicle comprising a door at a front end thereof;
a first, vertically-extending partition dividing the uppermost cubicle into a front and rear compartment;
a plurality of bus bars horizontally disposed within said rear compartment and access at at least one side of said rear compartment for making electrical connection to said bus bars;
a second vertically-extending partition dividing the middle cubicle into a front and a rear compartment of different sizes than the front and rear compartments of the uppermost cubicle;
a plurality of vertically-disposed bus bars connected to said horizontal bus bars and extending from said uppermost cubicle into said rear compartment of said middle cubicle;
a first rigid subchassis releasably coupled to said middle cubicle and disposed therein adjacent said partition, said first subchassis including connection means electrically interconnecting with a first contactor carriage assembly having a depth "d" and jumper means coupling said connection means to said vertically-disposed bus bars, said three cubicles having a uniform depth configured to accommodate said carriage assembly of depth "d";
a second rigid subchassis disposed within the lowermost cubicle and releasably coupled thereto, said second subchassis having connection means interconnecting a second contactor carriage with said vertically-extending bus bars, said connection means being disposed substantially beneath said rear compartment of said middle cubicle, said second carriage having two sets of fuses extending the depth of the carriage beyond the depth "d"; and
a plurality of bus bar extensions extending downwardly from said bus bars in said rear compartment of the middle cubicle, and coupled to said connection means in said lowermost cubicle.

4,463,409

ATTITUDE INDEPENDENT EVAPORATIVE COOLING SYSTEM

Frank E. Altoz, Catonsville, and John J. Chino, Arnold, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1983, Ser. No. 478,124
Int. Cl.³ H05K 7/20
U.S. Cl. 361—382 **10 Claims**



1. An attitude independent evaporative cooling system for maintaining electronic components of an airborne radar system, to which the cooling system is thermally coupled, below a predetermined maximum operating temperature comprising;
(a) means containing water coolant in intimate heat transfer relationship with the electronic components, which means is sealed to passage of water by a porous membrane which permits steam to pass through the membrane;
(b) a solid steam manifold coupled to the water containing means by the porous membrane;
(c) a normally closed pressure relief means included in the manifold whereby steam formed by evaporative heating of the water passes through the porous membrane to the steam manifold, and opens the pressure relief means at a predetermined pressure value corresponding to a water temperature at the predetermined maximum operating temperature permitting release of steam from the manifold and lowering the steam pressure in the manifold.

4,463,410

LIGHTING DEVICE WITH DUAL REFLECTING MEMBERS

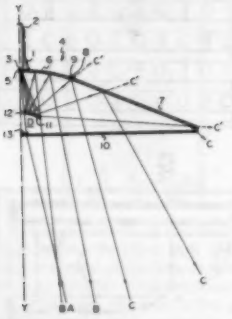
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,024
Claims priority, application Japan, Jun. 27, 1980, 55-87278; Mar. 16, 1981, 56-37384
Int. Cl.³ F21V 19/04
U.S. Cl. 362—20 **8 Claims**

1. A lighting device comprising:
a fitting for optical wave guide having an aperture for receiving therein an end section of at least one optical wave guide serving as a light source;
a first reflecting member connected to said fitting and having an opening for allowing the light rays issuing from said optical wave guide to pass there-through, said first reflecting member having a downwardly curved wall to define a concave lower surface, at least part of said lower surface adjacent said opening being provided with a reflecting surface;
a second reflecting member spaced from and aligned with said opening in said first reflecting member, said second

reflecting member having a convex reflecting surface facing the concave lower reflecting surface of said first member so that the light rays issued from the optical wave guide and impinging upon said second member are reflected towards said first member and then reflected by said lower surface of said first member downwardly thereby causing the light rays issued from the optical wave guide to be diffused outwardly;

said bottom opening of said downwardly curved first member being closed with a transparent flat bottom plate to



form a substantially hermetically sealed spaced therebetween;

said second reflecting member having a central opening aligned with said opening in said first member so as to allow the light rays to pass downwardly there-through and wherein a diverging lens is provided on said bottom plate in alignment with said central opening thereby to cause the light rays passed there-through to diverge outwardly; and

said remaining part of said first reflecting member other than that provided with the reflecting surfaces is translucent.

4,463,411

SUPPLEMENTARY UPPER BRAKE LIGHT

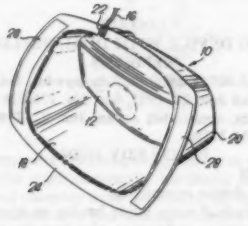
Ronald A. Proctor, Woodham La., Sedbury, Woking, England

Filed Aug. 14, 1981, Ser. No. 292,927

Claims priority, application Fed. Rep. of Germany, Jan. 6, 1981, 8100244[U]

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—61 **1 Claim**



1. A supplementary upper brake light for attachment to the inner surface of the rear window of a road vehicle, said brake light comprising:

(a) a one-piece moulded casing of light-impermeable synthetic plastic material having a silver-colored inside surface and being of generally triangular shape when seen in side view, said casing comprising a bottom wall and a rear wall lying substantially at right angles to each other with said bottom wall and said rear wall being closed at their ends by two opposing side walls of substantially triangular or truncated triangular shape;

(b) at least one electric light bulb and a mounting therefor supported within the casing in the region of said rear wall;

(c) a red-colored lens surrounding said electric light bulb and mounted against said rear wall of the casing while lying entirely within the casing; and

(d) a substantially flat flange formed peripherally on said casing to lie against the rear window of a road vehicle and extending substantially around the entire periphery of the casing, there being at least one adhesive element on said flange for attachment of the brake light casing to the inside surface of the vehicle rear window;

said bottom wall and said rear wall of the casing being so dimensioned that, with the casing flange attached to a vehicle rear window, the bottom and rear walls lie substantially horizontally and vertically, respectively, to ensure that light from the bulb is projected substantially horizontally to the rear of the vehicle, and said casing being of such a size as to surround the bulb and lens to a substantial extent whereby the passenger compartment of the road vehicle is shielded from the light of the bulb.

4,463,412

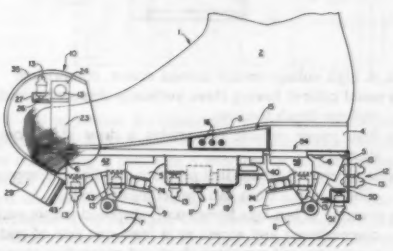
ILLUMINATED SHOE SKATE ATTACHMENT

Ronald W. Broach, 5418 Reading Rd., Cincinnati, Ohio 45237

Filed Feb. 1, 1982, Ser. No. 344,550

Int. Cl.³ A63C *17/26*

U.S. Cl. 362—61 **9 Claims**



1. A bracket assembly for illuminating a shoe skate having a toe and heel, and an elongated skate frame attached to the toe and heel of the skate shoe, said bracket assembly comprising:

a toe bracket, a lower bracket, and a rear bracket;

attachment means for detachably connecting the bracket frame to the skate frame;

fittings on said brackets for mounting light sources thereon;

means mounted on said brackets for providing electrical energy for said fittings;

switch means mounted on said brackets for actuating the light sources;

wherein said toe bracket surrounds the toe of said skate shoe; and

a light transmissive coverture which is attached to said toe bracket and which completely surrounds the toe bracket and the toe of said skate shoe, wherein said light transmissive coverture is spaced above the toe of said skate shoe and houses a light source and a light mounting bracket integral with said toe bracket in said space.

4,463,413

ADJUSTABLE PHOTOGRAPHIC LIGHT STAND

Howard L. Shirley, 514 Alhambra Rd., San Mateo, Calif. 94402

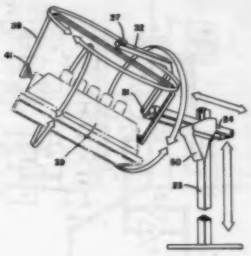
Filed Aug. 29, 1983, Ser. No. 527,208

Int. Cl.³ F21V *21/20*

U.S. Cl. 362—401 **19 Claims**

1. An adjustable stand assembly for lamps and the like, including a base member, a column extending upwardly from

said base member, a laterally extending boom arm, adjustable carriage assembly means for supporting, positioning, and maintaining said boom at any elevation along said column, an L-shaped gimbal arm, means for joining said gimbal arm at one



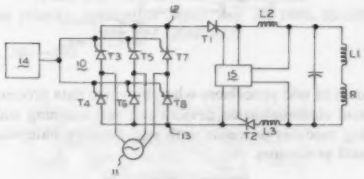
end to said boom arm in rotatable fashion, a C-shaped yoke member means for joining said yoke member at a medial portion thereof to the other end of said gimbal bracket in rotatable fashion, and means at the distal ends of said yoke member to secure the lamp head in rotating fashion.

4,463,414

ALTERNATING CURRENT POWER SUPPLY FOR HIGHLY INDUCTIVE LOADS

James P. Landis, Wauwatosa, Wis., assignor to Pillar Corporation, Milwaukee, Wis.

Filed Sep. 13, 1982, Ser. No. 416,855
Int. Cl.³ H02P *13/26*
U.S. Cl. 363—86 **6 Claims**



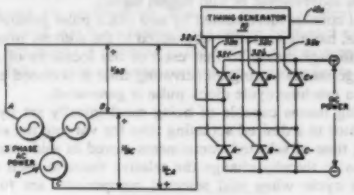
1. An alternating power supply for a highly inductive load comprising a DC source coupled to said load, a unidirectional controlled switching device connected in series between each terminal of said voltage source and said load for passing current pulses therebetween, inductor means connected in series between said switching devices and said load, capacitance means shunting said load, said load and said capacitance means forming a tank circuit having a resonant frequency, said controlled switching devices each having a turn-on means coupled to simultaneously receive an alternating voltage turn on signal having the frequency of the resonant frequency so that said controlled switching device will be turned on at the resonant frequency to provide current pulses to said load having said resonant frequency, the stored energy of the capacitance means being operative to turn the controlled switching device off between alternations of the voltage.

4,463,415

TIMING GENERATOR FOR USE WITH MULTI-PHASE CONTROL RECTIFIER SYSTEMS

Donald E. Vollrath, Greenfield, Wis., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Division of Ser. No. 234,064, Feb. 12, 1981, Pat. No. 4,348,718.
This application Aug. 9, 1982, Ser. No. 406,310
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.
Int. Cl.³ H02P *13/24*
U.S. Cl. 363—87 **10 Claims**



1. A method for selectively gating the appropriate semiconductor device in a multi-phase rectifier system of type including a plurality of selectively gateable semi-conductive devices coupled between a multi-phase power source and a D.C. load and arranged to couple D.C. voltage across the load comprising the steps of:

(a) producing a first signal having unique values representative of respective power line phase angles;

(b) producing a command signal indicative of the ignition phase angle at which gating is desired;

(c) comparing the first signal and command signal;

(d) sequencing a multi-state circuit having a plurality of sequentially occuring output states to the sequentially next state when the first command signals are substantially equal; and

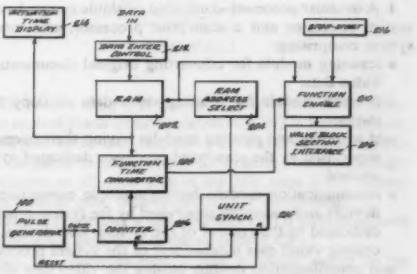
(e) coupling uniquely respective semi-conductive devices to a source of gating pulses in accordance with the output state and the ignition pattern associated with the multi-phase source.

4,463,416

PROGRAMMABLE AUTOMATIC CONTROLLER

Charles L. Wood, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 63,716, Aug. 6, 1979, abandoned, which is a continuation of Ser. No. 898,211, Apr. 20, 1978, abandoned.
This application Jul. 9, 1982, Ser. No. 396,853
Int. Cl.³ G06F *15/46*; C03B *9/40*
U.S. Cl. 364—143 **14 Claims**



1. A programmable automatic controller for controlling at least one section of a glassware forming machine, said at least one section including a plurality of movable components which operate in timed relationship with respect to one an-

other, said at least one section forming rigid glassware articles from gobs of molten glass, wherein said movable components are each actuated at respective relative times in each of a plurality of machine cycles, said controller comprising:

timing means for generating a digital signal providing an instantaneous indication of the time elapsed in each cycle of operation of said machine;

storage means for storing the relative times in a cycle of machine operation when each of the plurality of components is to be actuated;

an internal clock pulse generating means generating clock pulses independent of said digital signal;

a digital counter incremented by said clock pulse generating means, having an output connected to the address input of said storage means so that each of the locations of said storage means storing an actuating time is accessed each time a machine cycle clock pulse is generated;

switching means capable of being mechanically set by an operator to a desired actuating time for varying the actuating time of selected components stored in said storage means to thereby change the relative times in each machine cycle when said selected components are to be actuated;

function select means, responsive to said digital counter, for selecting the function whose actuating time is to be changed;

gating means for reading the setting on said switching means into said storage means;

comparator means for comparing said digital signal corresponding to the times elapsed in each cycle with at least one relative component actuating time stored in said storage means, said comparator providing an actuating signal when a favorable comparison results;

addressing means, responsive to the output of said digital counter, receiving said actuating signal from said comparator means for providing a component operating command to the component whose component actuating time compared with the cycle-out time elapsed; and

small containing means located adjacent to said at least one section for containing said means comprising said controller, said means comprising said controller producing substantially no heat and being so compact as to minimize cooling requirements.

4,463,417

MODULAR, PROCESSOR-CONTROLLED DOCUMENT DISTRIBUTION TERMINAL

Kenneth A. Bushaw, Longmont; William I. Branson, Boulder; Ted A. Rehage, and Frankie S. Shook, both of Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,635

Int. Cl.³ G06F *7/00, 9/00*

U.S. Cl. 364—200 **9 Claims**

1. A modular processor-controlled facsimile system having a system processor and a scan/print processor, said modular system comprising:

a scanning module for converting original documents into video data;

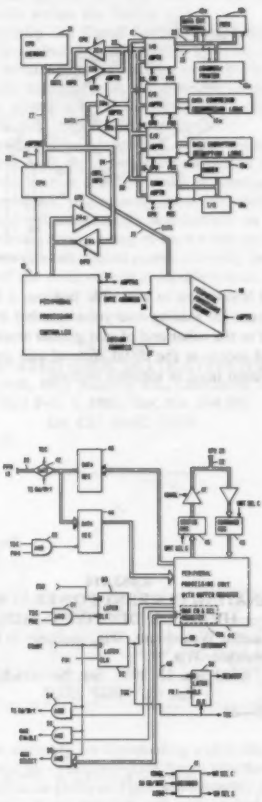
a printing module for printing video data on copy documents;

said scanning and printing modules having their operations supervised by the scan/print processor dedicated to their control;

a communication module having multiple communication devices and a memory supervised by the system processor dedicated to the control of the system, said devices processing video data independent of the system processor;

said communication module passing the video data along a data bus interconnecting said communication devices and said memory;

adapter means set to a supervisory mode by the system processor for coupling information from the system processor to the scan/print processor during a supervisory mode of operation and set to an automatic mode by the system processor for transferring video data between said scanning and printing modules and said data bus independent of said processors whereby video data processing by said communication devices and said scanning and printing modules proceeds with said memory independent of said processors.



4,463,418

ERROR CORRECTION FROM REMOTE DATA PROCESSOR BY COMMUNICATION AND RECONSTRUCTION OF PROCESSOR STATUS STORAGE DISK

John T. O'Quin, II; Robert A. Vossman, and Rebecca S. Wood, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1981, Ser. No. 280,023

Int. Cl.³ G06F *11/00*

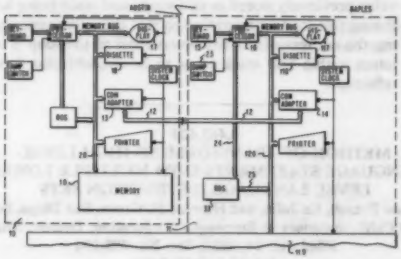
U.S. Cl. 364—200 **9 Claims**

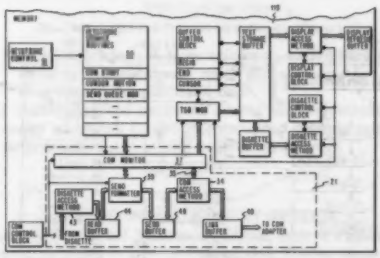
7. A process responsive to error conditions detected in remote data processing equipment for diagnosing and correcting said errors comprising

recording on magnetic media storage means, data representing the status of a remote data processor under an error condition,

transmitting said status data stored on said magnetic media

storage means to first receiving means distant from said remote processor, and





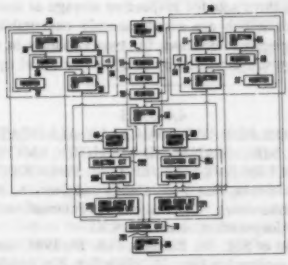
duplicating said status data on magnetic media storage means associated with said first receiving means whereby said duplicated status data is available for diagnostics.

4,463,419

MICROPROGRAM CONTROL SYSTEM

Hisao Takane, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Filed Sep. 24, 1981, Ser. No. 305,234
Claims priority, application Japan, Sep. 29, 1980, 55-135458
Int. Cl.³ G06F *9/22*
U.S. Cl. 364—200 **1 Claim**



1. A microprogram control system for use in a data processor comprising:

first control memory means for storing a plurality of microinstructions for an overwrite routine, each microinstruction possessing an operation code field and an address field;

main memory means for outputting predetermined stored microinstructions in response to the contents of the address field in the microinstructions for said overwrite routine received from said first control memory means;

second control memory means for storing the microinstructions output from said main memory means, said second control memory means also storing at least one microinstruction for reading out the microinstructions for the overwrite routine from said first control memory means;

means for addressing said first control memory means to output said microinstructions for said overwrite routine in response to said second control memory means issuing said at least one microinstruction; and

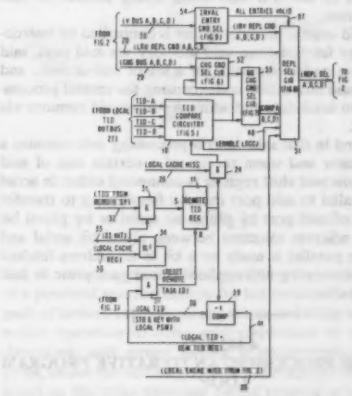
means for overwriting into said second control memory means said microinstructions output from said main memory means in response to the content of the operation code field in said microinstruction for said overwrite routine.

4,463,420

MULTIPROCESSOR CACHE REPLACEMENT UNDER TASK CONTROL

Robert P. Fletcher, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1982, Ser. No. 351,396
Int. Cl.³ G06F *9/30, 15/16, 13/00*
U.S. Cl. 364—200 **9 Claims**



1. Cache line entry replacement control for a cache directory in each of plural central processors (CPs) in a multiprocessor (MP), in which each respective CP makes storage requests to a local cache directory, each CP causing a cross-interrogation request to all other CPs in the MP upon a CP request having a cache miss, each respective CP comprising:

means for generating a task identifier (TID) associated with a program executing in the respective CP,

means for communicating a task identifier active in the respective CP to the other CPs in the MP,

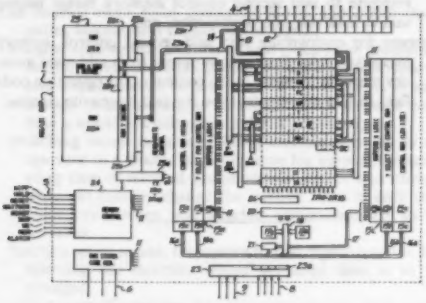
cache replacement selection means in the respective CP for enabling the replacement of a cache entry associated with the task identifier of another CP provided by the communicating means.

4,463,421

SERIAL/PARALLEL INPUT/OUTPUT BUS FOR MICROPROCESSOR SYSTEM

Gerald E. Laws, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 209,916, Nov. 24, 1980, abandoned. This application Jul. 26, 1983, Ser. No. 517,383
Int. Cl.³ G06F 3/00, 13/00
U.S. Cl. 364—200 9 Claims



1. A microprocessor system including:

a central processing unit constructed in a single semiconductor integrated circuit, and having a bidirectional parallel multiplexed address/data port and a plurality of control lines,

a memory having an address input and a data input/output connected to said port, operation of the memory being under control of said control lines,

peripheral means having terminals connected to said port, operation of the I/O unit being under control of said control lines,

wherein said central processing unit is controlled by instruction codes fetched from said memory via said port, said instruction codes consisting of a set of instructions, and some of said instruction codes causing the central processing unit to fetch data and addresses from said memory via said port,

characterized in that said central processing unit contains a shift register and upon receipt of a certain one of said instructions said shift register is connected either in serial or in parallel to said port thereby functioning to transfer data out of said port by plural bit serial or by plural bit parallel, wherein selection between plural bit serial and plural bit parallel is made by a bit in an address fetched from said memory and applied to said port prior to said data, transfer.

4,463,422

METHOD OF PROCESSING AN ITERATIVE PROGRAM LOOP

James E. Storer, Lexington, and James A. Waggett, Concord, both of Mass., assignors to CSP, Inc., Billerica, Mass.

Filed Jul. 12, 1982, Ser. No. 397,470
Int. Cl.³ G06F 9/30
U.S. Cl. 364—300 3 Claims

1. A method of operating a digital computer of the type having a control element for generating instruction addresses, wherein the control element comprises an adder, a stack, a selecter and a register, so as to facilitate computer execution of short, highly repetitive program loops, said method including the steps of

(a) initially storing the address of the first instruction in the program loop in the stack before said loop is entered and before said first instruction in said loop is executed, and

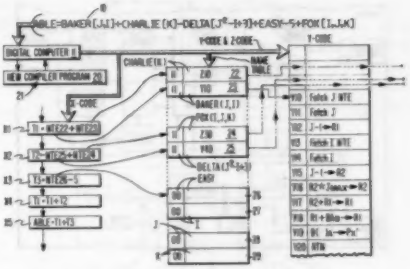
(b) thereafter generating the instruction address required in a fall through operation out of the loop, by loading the register with a sum obtained from the adder, and generating the instruction address required in a jump back operation to rerun the loop by loading the register with the value previously stored in said stack, said stack being held during this loading operation so that the value representing the address of the first instruction of the loop is left intact within said stack so as to be available for future reference.

4,463,423

METHOD OF TRANSFORMING HIGH LEVEL LANGUAGE STATEMENTS INTO MULTIPLE LOWER LEVEL LANGUAGE INSTRUCTION SETS

Hanan Potash, La Jolla, and Howard H. Green, San Diego, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 14, 1982, Ser. No. 398,194
Int. Cl.³ G06F 9/00
U.S. Cl. 364—300 14 Claims



1. In a digital computer, a method of transforming a relatively high level source language statement into first, second, and third sets of relatively low level object language instructions such that instructions of said first set are executable in an interleaved fashion with instructions of said second and third sets both of which are executable at the same time, said method including the steps of:

generating, via said computer, an instruction of said first set which specifies a mathematical operation in said statement and references two encoded addresses having the same code indicating that the respective addresses are of instructions in said second and third sets; and

producing, via said computer, said instructions of said second and third sets for respective storage at said encoded addresses which are simultaneously executable to compute respective addresses for two variables in said statement that are modified by said mathematical operation.

4,463,424

METHOD FOR DYNAMICALLY ALLOCATING LRU/MRU MANAGED MEMORY AMONG CONCURRENT SEQUENTIAL PROCESSES

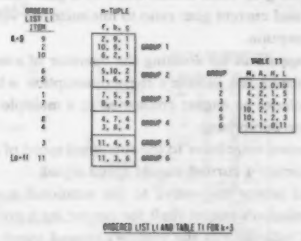
Richard L. Mattson, San Jose, Calif., and Juan A. Rodriguez-Rosell, Gaithersburg, Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 235,806, Feb. 19, 1981, abandoned. This application Oct. 21, 1983, Ser. No. 544,331
Int. Cl.³ G06F 13/00
U.S. Cl. 364—300 4 Claims

1. A CPU-implementable method for dynamically adjusting the portions of LRU-referenceable memory space shared among concurrently executing sequential processes in which a supervisory process is invoked to manage the memory referencing, wherein the steps include:

(a) determining an optimal space allocation among the processes by

(1) accumulating a trace of consecutive references to items stored in the LRU memory space;
(2) partitioning the space over a range of predetermined sizes;
(3) ascertaining the hit/miss ratios from the accumulated trace as a function of LRU memory space partition sizes; and



ORDERED LIST L1 AND TABLE T1 FOR k=3

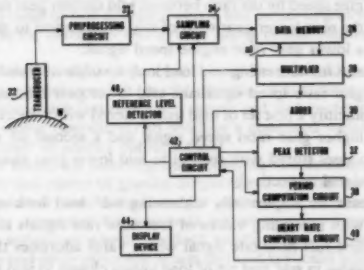
(4) responsive to each trace reference, LRU ordering the items in the partitioned space and adjusting for overflow among the partitions; and
(b) reallocating the partitions among the concurrent processes according to and in overlapped relation with the determination step by the the supervisory process.

4,463,425

PERIOD MEASUREMENT SYSTEM

Toshinori Hirano, and Masakazu Murase, both of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,163
Claims priority, application Japan, Jul. 17, 1980, 55-97820; Jul. 17, 1980, 55-97821
Int. Cl.³ G01R *23/02*
U.S. Cl. 364—417 **7 Claims**



1. A period measurement system for measuring the period of a biosignal, said period having a minimum value, comprising:
data memory means for storing sampled input biosignal data and for shifting the stored biosignal data when new biosignal data is entered;
autocorrelation function computation means for computing an autocorrelation function A (τ) of the sampled input biosignal data, given by the equation

$$A(\tau) = \frac{1}{n} \sum_{k=1}^{n} f(k) \cdot f(k+\tau)$$

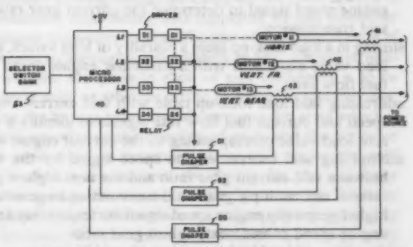
wherein a phase difference variable τ is specified over each computation cycle corresponding to k=1 to n, said variable τ being set to essentially the minimum value of the biosignal period being measured for an initial computation cycle, and thereafter incremented by a certain value in advance of each successive computation cycle of the autocorrelation function;
peak detection means for detecting a peak by comparing the autocorrelation function value previously computed by said function computation means with the autocorrelation function value most recently computed by said function computation means;
means for continuing the computation of the autocorrelation function for a fixed period of time following the detection by said peak detection means of a certain peak;
means for confirming that no peak larger than said certain peak exists in said fixed period of time, whereby said certain peak is determined to be a true peak; and
period computation means for computing the period of the biosignal based on the phase difference variable for which a peak is detected by said peak detection means.

4,463,426

AUTOMATIC POSITION CONTROL FOR A VEHICLE SEAT

Gary R. Caddick, Lake Orion, and Philip Q. Guest, Jr., Birmingham, both of Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 12, 1979, Ser. No. 84,108
Int. Cl.³ G06F *15/20*; B60N *1/02*
U.S. Cl. 364—424 **3 Claims**



1. A control apparatus for controlling the position of the seat of a powered seat mechanism for bidirectional travel in a fixed path of limited extent, said apparatus including a bidirectional motor operative to drive said mechanism in either of two directions, said motor having a predetermined number of poles, means for deriving control pulse signals from said motor based on the poles traversed during rotation of said motor for providing digital seat position data, memory and logic means for receiving said pulse signals and for storing data indicative of the position of the mechanism resulting from received pulses, manual selective position control means for said mechanism operative to operate said motor to set the position of said seat in a selected position by rotating said motor to traverse poles corresponding in number to said control signals, said memory and logic means including set position memory means for storing data indicative of the selected position, position recall means manually actuatable to signal the set position memory means to initiate operation of the motor, and means responsive to pulse signals from said logic and memory means for rotating said motor through a traverse of motor poles of the number necessary to move said mechanism to the selected position.

4,463,427

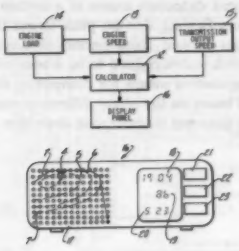
ROAD TRANSPORTATION VEHICLE DRIVE ASSIST PROCESS AND APPARATUS

Yves Bonnetain, Lyons, and Jean P. Sibeud, Chaponnay, both of France, assignors to Renault Vehicules Industriels, France

Continuation-in-part of Ser. No. 058,453, Jul. 18, 1979, abandoned. This application Jul. 30, 1981, Ser. No. 288,596

Int. Cl.³ B60K 41/18; G07C 5/08; G09B 19/16

U.S. Cl. 364—442 24 Claims



1. A method for assisting the operator of a motor vehicle to minimize the vehicle's fuel consumption wherein said vehicle includes an engine connected to a multiple gear ratio transmission, a first sensor generating a current engine speed signal having a value indicative of said engine's current speed, a second sensor generating a current ground speed signal having a value indicative of the vehicle's current ground speed, a third sensor generating a current fuel flow rate signal having a value indicative of the current fuel flow rate to said engine and a programmed computer having adequate storage and computational means, the method comprising the steps of:

dividing said current ground speed signal by said current engine speed signal to determine the current gear ratio of said transmission;

storing in a load look-up table a plurality of load values, each load value associated with a particular engine speed and fuel flow rate;

addressing said load look-up table with said current engine speed and current fuel flow rate signals to identify a current load value corresponding to the current engine load;

multiplying said current engine speed signal by the ratio between said current gear ratio and the next highest gear ratio of said multiple gear ratio transmission to generate a higher gear ratio engine speed signal corresponding to the engine speed at said next highest gear ratio;

addressing said load look-up table with said higher gear ratio engine speed signal to identify a first set of load values stored with respect to said higher gear ratio engine speed signal;

sequentially addressing said load look-up table with increasing values of fuel flow rate signals to find a first fuel flow rate signal whose value addresses the load value in said first set of load values closest to said current load value;

multiplying said current engine speed signal by the ratio between said current gear ratio and the next lowest gear ratio of said multiple gear ratio transmission to generate a lower gear ratio engine speed signal corresponding to the engine speed at the next lowest gear ratio;

addressing said load look-up table with said lower gear ratio engine speed signal to identify a second set of load values corresponding to said lower gear ratio engine speed;

sequentially addressing said load look-up table with increasing values of fuel flow rate signals to find a second fuel flow rate signal whose value addresses the load value stored in said second set of load values closest to said current load value;

comparing said first and second fuel flow rate signals with said current fuel flow rate signal to generate at least a first change gear signal when said first fuel flow signal is less than said second and current fuel flow rate signals and a second change gear signal when said second fuel flow rate signal is less than said first and current fuel flow rate signals; and

transmitting said first or second change gear signals to an operator perceptible device to generate an operator perceptible signal indicative of the desirability to shift said multiple gear ratio transmission to a gear ratio different from said current gear ratio to minimize the vehicle's fuel consumption.

21. An apparatus for assisting the operator of a motor vehicle to minimize the vehicle's fuel consumption wherein said vehicle includes an engine connected to a multiple gear ratio transmission comprising:

a first sensor responsive to the rotational speed of the engine to generate a current engine speed signal;

a second sensor responsive to the rotational speed of the transmission's output shaft for generating a ground speed signal indicative of the vehicle's ground speed;

a third sensor responsive to the rate of fuel flow to the engine for generating a current fuel flow rate signal;

means for generating a current gear ratio signal in response to said current engine speed and current ground speed signals;

an engine load look-up table storing a plurality of load values, each load value associated with a particular engine speed and a particular fuel flow rate;

means for addressing said engine load look-up table with said current engine speed and said current fuel flow rate signals to identify a current load value corresponding to the current engine load;

means for multiplying said current engine speed by the ratio between said current gear ratio and the next highest gear ratio of said transmission to generate a higher gear ratio engine speed signal and for multiplying said current engine speed by the ratio between said current gear ratio and the next lower gear ratio of said transmission to generate a lower gear ratio engine speed signal;

means for addressing said load look-up table with said higher gear ratio speed signal and said lower gear ratio signal to identify a first set of load values stored with respect to said higher gear ratio speed signal and a second set of load values stored with respect to said lower gear ratio speed signal respectively;

means for sequentially addressing said load look-up table with increasing values of fuel flow rate signals to find a first fuel flow rate signal whose value addresses the load value in said first set of load values closest to said current load value and find a second fuel flow rate signal whose value addresses the load value in said second set of load values closest to said current load value;

means for comparing said first and second fuel flow rate signals with said current fuel flow rate signal to generate at least a first change gear signal when said first fuel flow rate signal is less than said current and second fuel flow rate signals and a second change gear signal when said second fuel flow rate signal is less than said current and first fuel flow rate signal; and

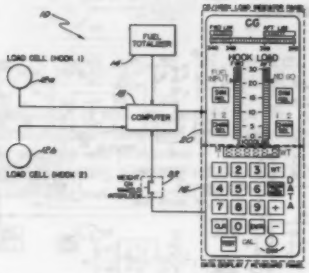
an operator perceptible device responsive to said first and second change gear signals for generating an operator perceptible signal indicative of the desirability to shift said multiple gear ratio transmission to a gear ratio different from said current gear ratio to minimize the vehicle's fuel consumption.

4,463,428

AIRCRAFT WEIGHT AND CENTER OF GRAVITY COCKPIT READOUT SYSTEM

Raymond J. Gilliam, Stratford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1981, Ser. No. 314,616
Int. Cl.³ G01M 1/12
U.S. Cl. 364—463 4 Claims



1. An in-flight aircraft weight and center of gravity cockpit readout device comprising:

a plurality of lifting hooks for attaching to and lifting a load external to said aircraft;

a plurality of load measuring means, adapted to sense the weight of said external load suspended from said lifting hooks, for continuously producing a first electrical signal proportional to said weight during the in-flight time of said aircraft;

fuel measuring means for continuously producing a second electrical signal proportional to the amount of fuel remaining in said aircraft's fuel tanks during the in-flight time of said aircraft;

keyboard input means for providing a third electrical signal proportional to said aircraft's weight and center of gravity prior to the takeoff of said aircraft lifting of said external load;

means for receiving and processing said first, second and third electrical signals from said plurality of load measuring means, said fuel measuring means and said keyboard input means respectively to produce a combined weight and center of gravity output signal;

indicator means for receiving and displaying said combined weight and center of gravity output signal from said microprocessor means and weight on wheels interlock switch, connected between said microprocessor means and a weight on wheels interlock switch, connected between said microprocessor means and said keyboard input means, for disabling said keyboard input means while said aircraft is in flight thus preventing data alterations from being entered therefrom.

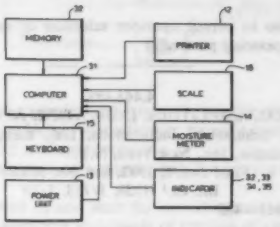
4,463,429

COMPUTER CONTROLLED APPARATUS FOR GRAIN ELEVATORS

Donald P. DeVale, Sycamore; Howard B. Wilbrandt, Crystal Lake; Dennis E. Tomlinson, St. Charles, and Ashish Shah, Dekalb, all of Ill., assignors to Industrial Design Engineering Associates, Ltd., Sycamore, Ill.

Filed Aug. 24, 1981, Ser. No. 295,686
Int. Cl.³ G06F 15/20; G06G 7/48
U.S. Cl. 364—466 4 Claims

1. A method for operating a grain elevator by automatically recording and calculating grain transactions for particular customers for present or future recall including records of customer position and account and the total quantities of different grains stored in the elevator as well as the moisture content of the different grains comprising the steps of weighing containers when they contain grain and also weighing containers after they have been emptied, measuring the moisture percentage of the grain in said container supplying to a computer with a programmable memory inputs indicative of weight and moisture, supplying selectable data from a keyboard to said computer, operating said computer under the control of a program for receiving and retaining in said memory standard moisture percentages and weights for said different grains from said keyboard as well as customer identification numbers, and storage and drying fees, determining in the net weight of the grain contained in each of said containers from signals from a scale means, determining the deviation of the moisture content of the grain in each of said containers from said standard moisture percentages retained in said memory, determining the drying fee for the grain in each of said containers, determining and supplying to said computer a



shrinkage factor for the grain in each of said containers, determining and supplying to said computer a damage factor for the grain in each of said containers, determining and supplying to said computer a foreign materials factor for the grain in each of said containers, determining and supplying to said computer the customer or customers identification of the grain in each of said containers, supplying information to said computer indicating whether the grain in each of said containers is to be immediately sold, or whether it is to be stored in said elevator, supplying the buying price to said computer for grain which is to be sold, calculating the quantity of grain and the net price for said grain which is determined from said net weight, said deviation of moisture content, the drying fee, the shrinkage factor, the damage factor and said foreign materials factor of said grain in each of said containers, and supplying and output of said computer which comprises an indication of the quantity and net price for said grain in each of said containers for each customer.

4,463,430

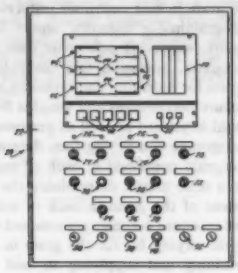
MICROPROCESSOR BASED PELLET MILL CONTROL

Joseph A. Volk, Jr., Florissant, and David Garner, Hazelwood, both of Mo., assignors to Beta Corporation, St. Louis, Mo.

Filed Aug. 31, 1981, Ser. No. 298,166
Int. Cl.³ G06F 15/46; G05B 1/02
U.S. Cl. 364—468 29 Claims

1. A digital electronic automatic controller for a continuous pelleting apparatus, said pelleting apparatus having means to produce pellets, said pellets being comprised of a plurality off ingredients, said controller having means to select a desired proportion of said plurality of ingredients to be used in the formulation of said pellets, means to control the rate of input of said ingredients, means to monitor a plurality of system operat-

ing parameters, means to control said ingredient input control in response to at least one of said system operating parameters,



and means to permit operator selection of said controlling system operating parameter

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4,463,431

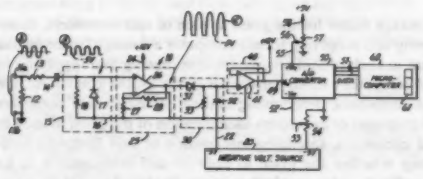
SIGNAL AMPLITUDE INDICATING APPARATUS

John W. Schumaker, Indianapolis, Ind., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,877

Int. Cl.³ H03K *5/153, 5/19*

U.S. Cl. 364—480 **2 Claims**



1. Indicating apparatus for a.c. signals having various fixed r.m.s. amplitudes falling within an r.m.s. amplitude range a consisting of r.m.s. amplitude subranges b and c of which c is the lower of said subranges, said apparatus comprising, input terminals for said a.c. signals, a half-wave rectifier stage coupled to said terminals for converting such a.c. signals thereon into half-wave rectified signals of which the respective peak magnitudes relative to a reference level are proportional to the respective r.m.s. amplitudes of such a.c. signals, amplifier and filtering stages for amplifying said rectified signals and for filtering them to convert them into d.c. level signals substantially free of a.c. frequency components, an n-bit A/D converter unit coupled to said last-named stages for receiving said d.c. level signals as inputs, said unit having for such inputs an acceptance range of voltage extending between adjustable lower and upper limits and being subdivisible by such unit into 2^n digital increments, and said unit being selectively responsive to those of said d.c. level signals having voltage values within said acceptance range to convert only those of said d.c. level signals with such values into n binary digital outputs indicating in binary form the number of such increments included between the voltage level of each of those signals and the lower limit of said acceptance range, circuit means for setting said lower and upper limits to the same voltage values as those of d.c. level signals corresponding to, respectively, ones of said a.c. signals having the r.m.s. amplitudes characterizing the lower and upper ends of said subrange b, and computer means responsive to said n digital outputs for (i) multiplying the number expressed thereby by a factor equal to the size of subrange b divided by 2^n, (ii) adding to the product thereby obtained a constant number expressing the size of subrange c, and (iii) converting the resulting number into decimal notation and displaying such decimal number.

4,463,432

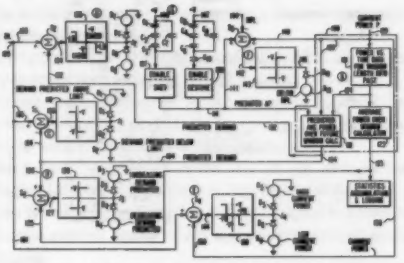
POWER CONTROLLER USING DUAL DEADBANDS FOR REDUCING OSCILLATORY LOAD MANIPULATIONS

Woodward C. Carter, II, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1981, Ser. No. 296,277

Int. Cl.³ G06F *1/00*

U.S. Cl. 364—483 **8 Claims**



1. In a power demand control system associated with a plant having loads supplied with electrical energy from utility power lines including: means for selecting loads selected to be switched from one of an ON and OFF status to the other in accordance with a priority schedule to maximize production while maintaining within a deadband about an assigned demand limit reference signal the energy consumed by the plant; and means for measuring the power consumed from said power lines for a predetermined number N of equal time intervals, each defined between two consecutive said sampling instants; the combination of:

first means responsive to the power measured by said measuring means during (N-1) consecutive said time intervals ending at a present sampling instant for providing a first signal representative of the (N-1) time interval demand of energy consumed during said (N-1) consecutive time intervals;

second means responsive to said measuring means and to said first means for predicting at said present sampling instant the deviation of demand during the time interval subsequent to said present sampling instant and for providing a second signal representative of the amount of power consumed at said sampling instant if maintained constant during said subsequent time interval;

third means for comparing said demand limit reference signal to the sum of said first and second signals as a representation of predicted demand for N time intervals for deriving an error relative to said demand limit; and

means for switching a selected load in response to said error exceeding said demand deadband, thereby to maintain the assigned demand limit within the demand deadband, while minimizing load switching manipulation.

4,463,433

PEDALLING EFFICIENCY INDICATOR

Maury L. Hull, Winter, and Rory R. Davis, San Diego, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 9, 1981, Ser. No. 310,419

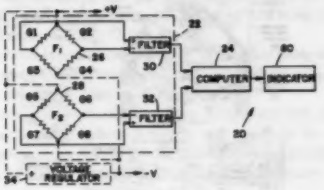
Int. Cl.³ G01L *5/02*

U.S. Cl. 364—506 **14 Claims**

1. For a pedacycle of the type including a crankset being rotatably mounted in said pedacycle and defining an axis, said crankset having a crank arm generally extending radially from said axis and a pedal being rotatably mounted to a distal end of

said crank arm and extending axially outwardly from said crank arm, a pedalling efficiency indicator comprising:

means for measuring a first force being normal to a selected one of said crank arm and said pedal and being in a plane



perpendicular to said axis, and further for measuring a second force being tangential to said selected one of said crank arm and said pedal; and

means for computing pedalling efficiency as a function of said first force and said second force.

4,463,434

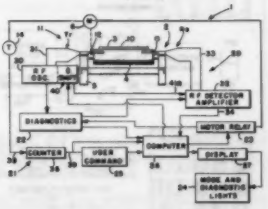
DIGITAL PHASE SHIFT CIRCUIT SIGNAL GENERATOR FOR RIP DETECTORS

Lyle M. Haylett, Mantua; Robert J. Houck, Akron, both of Ohio, and Kevin J. King, Deerwood, Minn., assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,882

Int. Cl.³ G06F *15/46*; G08B *21/00*

U.S. Cl. 364—507 **19 Claims**



1. For use in a conveyor belt rip detector including input and output coupling means for coupling an AC signal to antennas carried by the conveyor belt and for receiving an AC signal transmitted by respective antennas, and detector means for monitoring such AC signals received by said output coupling means and a reference signal to detect the integrity of the conveyor belt, the improvement comprising: a circuit for generating such AC signal and such reference signal which may be relatively shifted in phase by a selected amount, including input means for receiving an AC input signal of a first frequency, frequency divider means for dividing the frequency of such AC input signal to derive a first AC signal, as one of such AC signal and reference signal, at a second frequency smaller than such first frequency, and digital phase shifter means responsive to an output of said frequency divider means for producing a second AC signal, as the other of such AC signal and reference signal, shifted in phase a selected amount from such first AC signal.

4,463,435

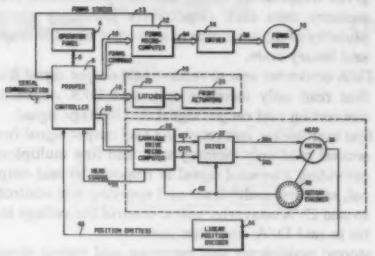
PRINTER CONTROL SYSTEM WITH CONTROLLED ACCELERATION AND DECELERATION

Barry R. Cavill, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1981, Ser. No. 312,058

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—519 **6 Claims**



1. Print head control means for controlling the acceleration of a print head which is bidirectionally movable across a print line on a record medium comprising:

motor means having a rotatable shaft for moving said print head;

means coupled to said shaft for providing two movement signals manifesting increments of rotation of said shaft;

processor means for repeatedly comparing the time between said two movement signals with stored data representing a desired acceleration velocity profile to generate an output;

said processor means including scaling means for scaling said processor means output to produce an error count which is not proportional to the difference between said movement signals and said desired acceleration velocity profile during said acceleration;

control means responsive to said error count to generate an error voltage; and

motor control means responsive to said error voltage for controlling the rotational speed of said shaft.

4,463,436

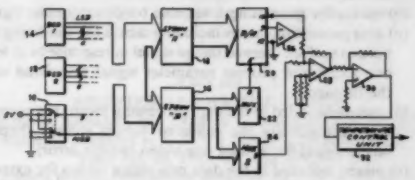
PROGRAMMABLE DIGITAL TEMPERATURE CONTROLLER APPARATUS

Brian J. Veneklase, Vandalia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 23, 1981, Ser. No. 324,347

Int. Cl.³ G05D *23/00*

U.S. Cl. 364—557 **6 Claims**



1. A programmable digital temperature controller apparatus comprising in combination:

coding means for generating a binary word, said binary word comprising a plurality binary digits, said plurality of binary digits representing a pre-selected temperature,

first and second read only memory units to simultaneous

receive said binary word from said coding means, said first and second read only memory units storing a plurality of digital words, said digital words stored in said first read only memory represent temperature sequences within the temperature range of said controller apparatus and each of said digital words stored in said second read only memory represents a control signal for controlling the voltage per bit level in a D/A converter and a starting voltage for a given temperature range, said first and second read only memory units each respectively providing one of said plurality of digital words as an output signal in response to said binary code,

a D/A converter unit to receive said output signal from said first read only memory unit, said D/A converter unit converting said output signal to a voltage signal,

a first multiplexer unit receiving said output signal from said second read only memory unit, said first multiplexer unit providing a control signal in response to said output signal, said first multiplexer unit applying said control signal to said D/A converter unit to control the voltage level per bit in said D/A converter unit,

a second multiplexer unit receiving said output signal from said second read only memory unit, said second multiplexer unit providing a starting voltage for a given temperature range in response to said output signal,

a first operational amplifier receiving said voltage signal from said D/A converter unit, said first operational amplifier providing said voltage signal as an output,

a summing means receiving said starting voltage from said second multiplexer unit and said voltage signal from said first operational amplifier, said summing means summing said starting voltage and said voltage signal to provide a voltage output signal, and,

a second operational amplifier receiving said voltage output signal, said second operational amplifier providing said voltage output signal as an output, said voltage output signal representing said pre-selected temperature.

4,463,437

FURNACE BURDEN THERMOGRAPHIC METHOD AND APPARATUS

Arthur J. Schenck, Glenmoore; John P. Hoffman, Coopersburg, and Glenn R. Crossley, Emmaus, all of Pa., assignors to Bethlehem Steel Corp., Bethlehem, Pa.

Continuation-in-part of Ser. No. 257,845, Apr. 27, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 539,209

Int. Cl.³ G01J *5/18*; H04N *7/18*

U.S. Cl. 364—557 **16 Claims**

15. Apparatus for determining a furnace burden surface thermograph, which comprises:

(a) means for producing a burden surface thermal image signal from a video camera viewing obliquely the burden surface and covering various stocklines;

(b) means for generating a variable burden stockline signal;

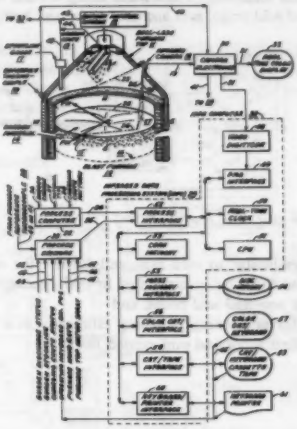
(c) data processing means including means for validating the burden surface thermal image signal in response to at least one monitored process parameter signal associated with the furnace;

(d) means included in the data processing means for correcting electronically the validated burden surface thermal image signal for at least one video camera error;

(e) means included in the data processing means for extracting at least one key feature of the corrected burden surface thermal image signal at various values of burden stockline signals to represent a cross-sectional segment of the furnace burden surface;

(f) means included in the data processing means for classifying the extracted thermal image signal according to burden charging material and pattern characteristic signals;

(g) means included in the data processing means for storing the classified thermal image signal; and



(h) means for utilizing the stored thermal image signal to cause the production of an intelligible representation of the burden surface temperature and burden classification.

4,463,438

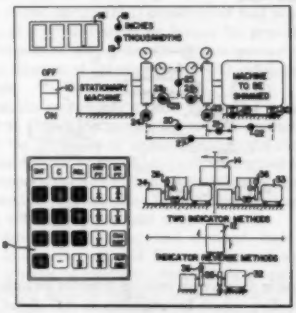
SHAFT ALIGNMENT CALCULATOR

John M. Zatezalo, Sewickley, and Lucian J. Spalla, McMurray, both of Pa., assignors to Industrial Maintenance Systems, Inc., Pittsburgh, Pa.

Filed Dec. 11, 1981, Ser. No. 329,707

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—715 **6 Claims**



1. A calculator for calculating distances that two machines coupled to each other must be moved so that shafts coupled between the machines will be in proper alignment comprising:

a. a keyboard having at least numerical keys for inputting measurement data,

b. a display connected to the keyboard for displaying numbers typed on the keyboard and numbers calculated therefrom,

c. a face plate to which the keyboard and display are attached having thereon at least one illustration of two machines having interconnected shafts with gauges mounted thereon,

d. a memory unit storing a program and capable of storing the input measurement data,

e. first indicator means attached to the face plate near the

illustration to indicate places to be measured in a sequence compatible with the program,

f. a processing unit connected to the keyboard, memory and display for receiving data entered on the keyboard, calculating the distances that the two machines must be moved according to the program contained in the memory, and transmitting a result to the display,

g. second indicator means attached to the face plate near the illustration to indicate at least one point where at least one of the machines must be moved, and

h. a decoding unit connected to the processing unit, display, first and second indicator means, and memory for receiving signals from the processing unit and for actuating the first and second indicator means and the memory.

4,463,439

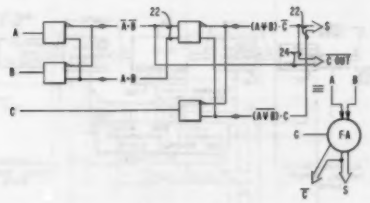
SUM AND CARRY OUTPUTS WITH SHARED SUBFUNCTIONS

Arnold Weinberger, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 17, 1982, Ser. No. 379,371

Int. Cl.³ G06F 7/50

U.S. Cl. 364—784 **5 Claims**



1. An adder of the type where sum and carry functions are produced by a plurality of individual full adder stages, which comprise:

(a) first half adder type means for producing a partial sum as a bundle of subfunction signals one being a subfunction of the trues and the other a subfunction of the complements of two inputs when those inputs are both true or both complements,

(b) second half adder type means for producing a partial sum as a bundle of subfunction signals one being said subfunction of the trues and the other said subfunction of the complements of said two inputs when those inputs are not both true or both complement,

(c) full adder stage means including one of said half adder type means as a first half adder stage said full adder stage means generating full sum functions as a bundle of subfunction signals and full carry functions as a bundle of subfunction signals wherein the full carry functions include a subfunction signal of the other of said half adder type means and subfunction signal of said full sum function bundle, and

(d) means for transmitting said full sum and carry functions of an adder stage each as a bundle of such subfunction signals to other full adder stages.

4,463,440

SYSTEM CLOCK GENERATOR IN INTEGRATED CIRCUIT

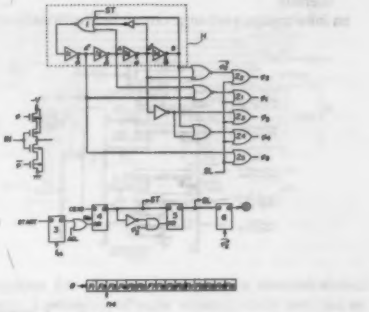
Yoshikazu Nishiura, Yamatokoriyama; Takitsugu Mineyama, Nara, and Kazno Inoue, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1981, Ser. No. 254,543

Claims priority, application Japan, Apr. 15, 1980, 55-51081; Apr. 18, 1980, 55-52015

Int. Cl.³ G06F 1/04

U.S. Cl. 364—900 **1 Claim**



1. A system clock generator comprising:

clock signal generating means for developing a plurality of sequentially phase shifted clock pulses;

logic means responsive to said clock signal generating means for developing system clock output signals from said sequentially phase shifted clock pulses;

clock control signal generator means operatively connected to said clock signal generating means and said logic means for developing a clock inhibit signal for inhibiting operation of said clock signal generating means and for developing a system clock output signal inhibit signal;

disable means for inhibiting application of said system clock output signals to an output when said system clock output signal inhibit signal is developed by said clock control generation means;

said clock control signal generator means including;

first means for developing said clock inhibit signal,

second means responsive to said first means for developing said system clock output signal inhibit signal, the development of said clock inhibit signal by said first means being terminated in response to a start signal applied thereto,

said second means terminating development of said system clock output signal inhibit signal only when development of said clock inhibit signal has been terminated by said first means and said second means has detected development of a selected one of said system clock output signal to thereby syncronize timing of said clock pulse and system clock output signals.

4,463,441

REGISTER ARITHMETIC DEVICE

Nikola K. Kassabov, and Lyudmil G. Dakovski, both of Sofia, Bulgaria, assignors to V M E I "Lenin", Sofia, Bulgaria

Filed Jul. 20, 1981, Ser. No. 284,991

Claims priority, application Bulgaria, Jun. 22, 1980, 48568

Int. Cl.³ G06F 7/48

U.S. Cl. 364—900 **1 Claim**

1. An arithmetic register device which comprises:

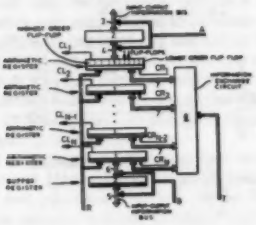
N number of n-bit arithmetic registers each having a respective lowest order flip-flop, a highest order flip-flop and intermediate order flip-flops between said lowest order flip-flop and said highest order flip-flop,

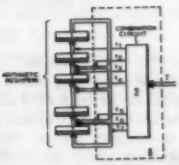
a first buffer register connected to a first of said arithmetic registers for bidirectional information transfer therebetween, said first buffer register being additionally connected to a first input-output information bus;

a second buffer register connected to the Nth arithmetic register for bidirectional transfer of information therebetween, said second buffer register being additionally connected to a second input-output information bus;

respective first and second control buses connected to said buffer registers for controlling the transfer between said buffer registers and the arithmetic registers connected thereto;

an information exchange circuit bidirectionally connected to





all of said arithmetic registers for controlling information transfer therebetween such that the first register is connected to all of the other registers and every other register is also connected to a preceding and a succeeding register;

an operational input bus unidirectionally connected to all of said arithmetic registers for presetting operational codes for the computation of information in said arithmetic registers; and

one-digit input buses respectively connected to the control ports of the lowest order flip-flops of each of said arithmetic registers, and respective output buses connected to the control ports of the highest order flip-flops of each of said arithmetic registers to enable word-size expansion of the information words stored in said arithmetic registers.

4,463,442

EMULATION OF DATA PROCESSING DISPLAY TERMINALS OF VARIABLE SCREEN SIZE ON THE DISPLAY OF A TEXT PROCESSOR

Richard P. Dachowski, Round Rock, and Patrick D. Motola, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,185
Int. Cl.³ G06F *3/14*
U.S. Cl. 364—900 **4 Claims**

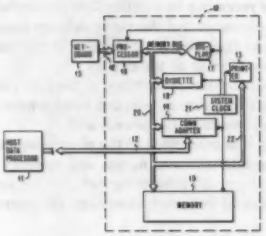
1. In a text processing system having an interactive display terminal and means for conducting text processing sessions involving operations wherein the processing affects only the format of the information, the improvement comprising

means for initiating a data processing session wherein said interactive display terminal emulates a data processing terminal,

means for interrupting the text processing session being conducted,

means for reinitiating the interrupted text processing session at the completion of the data processing session,

data processing means connected to said display terminal and operable during said data processing session, and



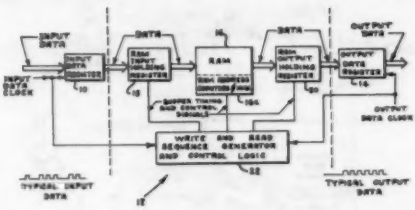
means operative during said data processing session to define outer dimensions of a limited area on the display terminal which are equal to the dimensions of the data processing display terminal being emulated.

4,463,443

DATA BUFFER APPARATUS BETWEEN SUBSYSTEMS WHICH OPERATE AT DIFFERING OR VARYING DATA RATES

David G. Frankel, Columbia, and Michael J. Barrett, Severn, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 60,066, Jul. 24, 1979, abandoned. This application Oct. 22, 1981, Ser. No. 313,861
Int. Cl.³ G06F *3/00*
U.S. Cl. 364—900 **5 Claims**



1. An asynchronous input/output data buffer apparatus comprising in combination:

an input data register to receive input data synchronously with a first clock rate, said input data register having the capability to store N data bits, where N is a positive integer greater than one, said input data register providing a first pulse signal when the register is full,

a write/read sequence generator producing a series of write and read signals, said write/read sequence generator receiving a high speed clock signal, said write/read sequence generator continuously circulating a single logical one within itself, said write/read sequence generator receiving said first pulse signal and generating a write signal in response thereto, said write/read sequence generator receiving a second pulse signal and generating a read signal in response thereto,

a data storage and retrieval means to receive said input data from said input data register upon receipt of said write signal from said write/read sequence generator, said data storage and retrieval means receiving said input data at said first clock rate, said data storage and retrieval means holding said input data, said data storage and retrieval means having a storage capacity of 2N data bits, said data storage and retrieval means generating a continuous free-running control clock, said input data being transferred

within said data storage and retrieval means in synchronism with said free-running control clock, said data storage and retrieval means providing a data output upon receipt of said read signal from said write/read sequence generator, and,

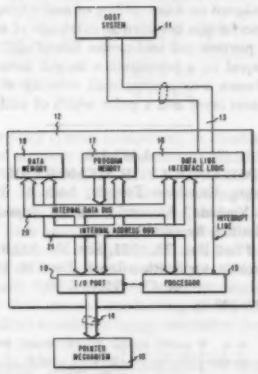
an output data register connected to said data storage and retrieval means to receive said data output, said output data register providing said second pulse signal when the register is empty, said output data register receiving said data output at a second clock rate, said output data register providing output data at said second clock rate whereby input data at a first clock rate from a first subsystem is transferred to a second subsystem as output data at a second clock rate, said first subsystem operating at said first clock rate, said second subsystem operating at said second clock rate.

4,463,444

WORD PROCESSING SYSTEM HAVING A FORMATTING BIDIRECTIONAL PRINTER

Paul R. Daniels, Round Rock; Daniel J. Moore, and Ha H. Nguyen, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,940
Int. Cl.³ G05B *1/01*
U.S. Cl. 364—900 **5 Claims**



1. In a bidirectional printer system, apparatus for converting sequential data readable in one direction representative of the format of the printed matter into data readable in either the forward or reverse directions comprising:

means for sequentially storing blocks of data representations of the characters to be printed,

means for storing blocks of control data representative of the format in which said characters are to be printed interspersed with said blocks of data representations of characters,

means for storing control block identifier data at sequential storage positions both immediately preceding and at the end of said control data blocks, and

means for reading said stored data sequentially in either the forward or the reverse direction,

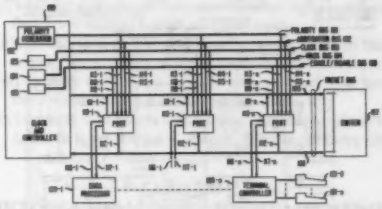
whereby said identifier data will be read prior to said control block data irrespective of whether stored data is being read in the forward or in the reverse direction.

4,463,445

CIRCUITRY FOR ALLOCATING ACCESS TO A DEMAND-SHARED BUS

Gary J. Grimes, Thornton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 7, 1982, Ser. No. 337,672
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 **17 Claims**



1. In a system for allocating access to a demand-shared facility among a plurality of units wherein each unit has an assigned unique n digit priority number for determining facility access during concurrent requests by said units, said system comprising;

an arbitration bus interconnecting all of said units,

means in each of said units for requesting access to said demand-shared facility,

a plurality of multistate logic devices in each of said units,

means for selectively and combinationally switching said logic devices from a first to a second state in each of said units under control of specified parameters representing the current dynamic state of said units,

a system controller for controlling said means for switching said logic devices,

means for forming a dynamic priority number for each of said units by applying the outputs of said logic devices as parameter digits to the more significant digit positions of said dynamic number and by applying the digits of said assigned priority number to the lesser significant positions of said dynamic number,

a mask bus interconnecting said units,

means for applying a mask signal at selected times to said mask bus,

means in each of said units currently requesting access to said demand-shared facility for concurrently superimposing the corresponding digits of the associated dynamic priority number onto said arbitration bus sequentially digit by digit,

means for comparing the digit values on said bus with the corresponding digit values applied by each of said requesting units,

means in each unit responsive when said mask signal is extant on said mask bus for disabling said comparing means so that said parameter digits superimposed on said bus are not used in determining unit access, and

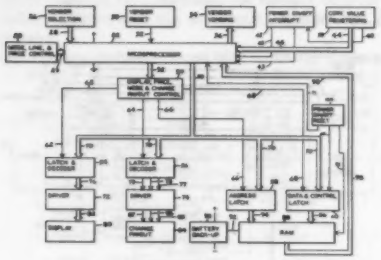
means for removing from facility access contention a requesting one of said units upon the detection of a prescribed comparison result between a bus digit value and the corresponding digit value applied by said unit,

said disabling means being effective so that said preference for facility access between said concurrently requesting units is determined by any parameter digits whose comparison is not disabled and by the applied digits of said assigned priority numbers of said requesting units.

4,463,446
CONTROL DEVICE

Hasmukh R. Shah, and Ashok K. Gupta, both of Hot Springs, Ark., assignors to U.M.C. Industries, Inc., New York, N.Y.

Continuation of Ser. No. 181,232, Aug. 25, 1980, abandoned.
This application Jul. 20, 1982, Ser. No. 400,059
Int. Cl.³ G06F 3/02, 7/50, 11/00
U.S. Cl. 364—900 21 Claims

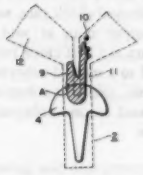


1. A data writing and storing system for a money-actuated vending machine which has a data checking mode and a money-dependent dispensing mode and which has patron-operated selection switches and which has money-responsive units and which comprises a memory that has a plurality of selectable locations wherein data can be stored, one of said selectable locations storing a running count of information resulting from operation of said vending machine, further of said selectable locations storing prices of products to be vended by said vending machine, a temporary store in which a temporary count of said information can be held, controlling and interconnecting means which, during said dispensing mode, enable said data writing and storing system to respond to actuation of a desired one of said patron-operated selection switches and to the accumulation of sufficient credit due to the insertion of money in said money-responsive units to sense and respond to data that is stored within one of said further of said selectable locations to automatically initiate operations wherein said temporary count in said temporary store is incremented said data writing and storing system automatically adding each temporary count which is developed in said temporary store during a vending cycle of operation of said vending machine to said running count to provide a permanent running count that is repeatedly and automatically incremented during successive operations of said vending machine, a digital visual display readout comprising a predetermined number of digital visual display elements which can display indicia identifying said one of said selectable locations and which can display said running count or which can display indicia identifying various of said further selectable locations and which can display the prices therein, and switching means that is separate from and in addition to said patron-operated selection switches which can select said one or said further of said selectable locations and thereby cause said digital visual display readout to display said indicia identifying said one of said selectable locations and said running count stored in said one selectable location or which can display indicia identifying various of said further selectable locations and the prices therein, said running counts indicia and said prices indicia being selectably displayable at the option of an operator of said data writing and storing system data writing and storing system keeping said operator from altering or changing either of said running counts, other than by causing said data writing and storing system to receive by actuation of said switching means.

4,463,447
MAGNETIC BUBBLE GENERATOR

Ryo Suzuki, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1981, Ser. No. 277,608
Claims priority, application Japan, Jun. 27, 1980, 55-86624
Int. Cl.³ G11C 19/08
U.S. Cl. 365—12 12 Claims

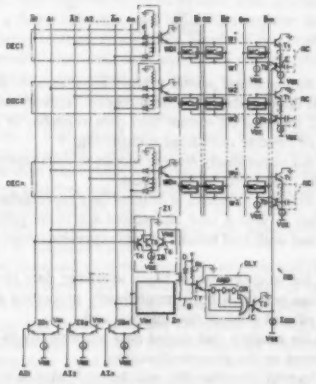


1. A magnetic bubble generator comprising a layer of a magnetic material in which a magnetic bubble can move in response to a rotating field; a propagation path which is constructed of elements of a soft magnetic material of high permeability the elements being disposed on the magnetic material layer through an insulating layer at a fixed period; and a conductor loop which consists of a hairpin portion and wiring portions and which is disposed between said magnetic material layer and said propagation path in a manner to be insulated therefrom in order to generate said magnetic bubble within a part of said magnetic material layer corresponding to said propagation path by causing a pulse current to flow; a width of said each wiring portion being specified so as not to exceed ½ of said period of said propagation path under a condition that a length measured on a center line of said wiring portion from a point of intersection between an extension of an outer edge of said hairpin portion and said center line of said wiring portion is at least equal to a propagation length determined from a product between a saturation wall velocity of said magnetic material of said layer and a pulse width of said pulse current.

4,463,448
SEMICONDUCTOR MEMORY DEVICE

Yasuhisa Sugo; Kazuhiro Toyoda, both of Yokohama, and Katuyuki Yamada, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 23, 1981, Ser. No. 333,812
Claims priority, application Japan, Dec. 24, 1980, 55-183078
Int. Cl.³ G11C 7/00
U.S. Cl. 365—190 9 Claims



6. A selection circuit for a semiconductor memory device

having word lines and being operatively connected to receive address signals, said selection circuit comprising:

a discharge current circuit including a first transistor for discharging a word line;

detecting means for detecting changes in the address signals and for providing a detected output varying in accordance with said detected changes in the address signals, said detecting means including a second transistor which together with said first transistor forms a current switch, said second transistor is turned OFF in accordance with said detected output for effecting a temporary flow of discharge current through said word line only when said first transistor turns ON due to said detected changes in said address signals.

4,463,449

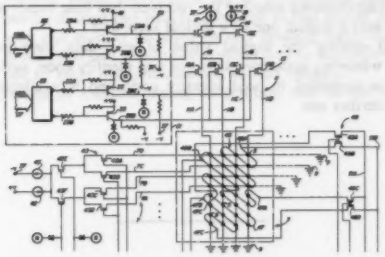
FIELD EFFECT TRANSISTOR CORE MEMORY SWITCHING SYSTEM AND METHOD

John F. Bruder, Phoenix, and Sam L. Rainwater, Tempe, both of Ariz., assignors to Quadri Corporation, Tempe, Ariz.

Filed Jul. 20, 1981, Ser. No. 284,615

Int. Cl.³ G11C *7/02*

U.S. Cl. 365—196 **22 Claims**



1. A core memory system comprising in combination:

(a) an array of memory cores, including a plurality of groups of said memory cores;

(b) a plurality of select lines, each extending through each memory core of a respective one of said groups, each of said select lines having a first end and a second end, each of said second ends being coupled to a first conductor;

(c) a plurality of field effect transistors each having a gate electrode and first and second current conducting electrodes, the first current conducting electrode of each of said field effect transistors being coupled to the first end of a respective ones of said select lines;

(d) first current driving means coupled to the second current conducting electrodes of said field effect transistors for controllably forcing a first select current through a selected one of said field effect transistors and into the one of said select lines coupled to the first current conducting electrode of said selected field effect transistor during a first type of memory cycle;

(e) second current driving means coupled to the second current conducting electrodes of said field effect transistors for controllably forcing a second select current through said selected one of said field effect transistors and out of said one of said select lines coupled to the first current conducting electrode of said selected field effect transistor during a second type of memory cycle; and

(f) selection means responsive to a digital address signal for producing a plurality of gate control signals to control the respective gate electrodes of said plurality of field effect transistors, one of said gate control signals being applied to the gate electrode of said selected one of said field effect transistors and turning said selected field effect transistor on, others of said gate control signals being applied to the gate electrodes of others of said field effect transistors to maintain said others of said field effect transistors in an off condition, said digital address signal representing the one of said select lines coupled to the first current conducting electrode of said selected field effect transistor,

wherein said first type of memory cycle is a read cycle and said first select current is a read select current, and wherein said second type of memory cycle is a restore or write cycle and said second select current is a restore or write select current, and wherein said selection means includes gate control signal modulating means for

(i) causing said one of said gate control signals to have a first level during a read memory cycle,

(ii) causing said one of said gate control signals to have a second level during a restore or write memory cycle,

(iii) causing said others of gate control signals to have a third level during a read memory cycle, and

(iv) causing said others of said gate control signals to have a fourth level during a restore or write memory cycle.

4,463,450

SEMICONDUCTOR MEMORY FORMED OF MEMORY MODULES WITH REDUNDANT MEMORY AREAS

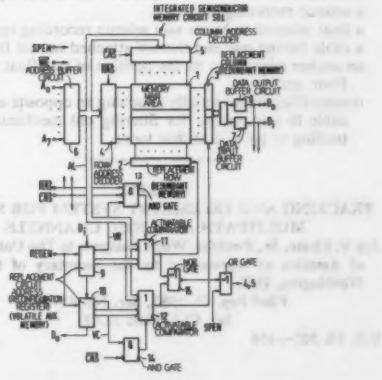
Hans Haeusele, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 12, 1981, Ser. No. 292,339

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032630

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—200 **6 Claims**



1. A semiconductor memory system formed by a plurality of memory modules, each memory module comprising:

(a) a plurality of integrated semiconductor memory circuits, each of said integrated semiconductor memory circuits having

(i) a main memory area,

(ii) a redundant memory area, and

(iii) circuit means for replacing faulty parts of said main memory area by means of corresponding parts of said redundant memory area, said circuit means having a reconfiguration register means in the form of volatile auxiliary memories for reception and storage of data used for proper functioning of said circuit means for replacing the faulty parts;

(b) a single, non-volatile auxiliary memory means for auxiliary storage of data of all integrated semiconductor memory circuits of the memory module which are required for proper functioning of the semiconductor memory circuit for the replacement of faulty parts of the main memory area in the memory circuit; and

(c) said non-volatile auxiliary memory means comprising a programmable read-only memory (PROM);

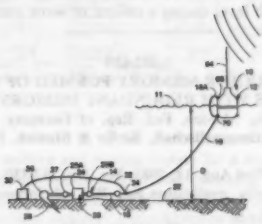
whereby each of said memory modules is a relatively small and inexpensive exchangeable unit of said semiconductor memory system which can be easily mechanically replaced during normal maintenance work.

4,463,451

SYSTEM FOR SEISMIC DIGITAL DATA ACQUISITION OVER WATER COVERED AREAS

Ralph E. Warmack; O. Guy Marney, Jr.; John N. Gallagher, all of Tulsa, Okla., and Paul R. Passmore, Dallas, Tex., assignors to The Standard Oil Company, Chicago, Ill.

Filed Jan. 11, 1982, Ser. No. 338,468
Int. Cl.³ G01V *1/38*
U.S. Cl. 367—16 **7 Claims**



1. A marine seismic data acquisition system, comprising:

a seismic recording system;

a float adapted to house said seismic recording system;

a cable having one end thereof attached to said float;

an anchor adapted to fix the position of said float to the sea floor; and

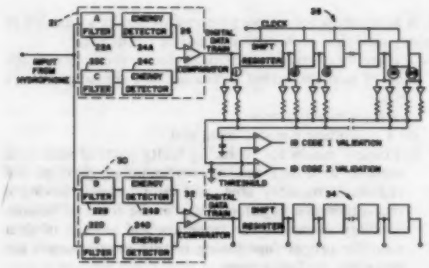
tension filter means serially attaching an opposite end of said cable to said anchor for filtering out mechanical forces tending to jar said anchor loose.

4,463,452

TRACKING AND TELEMETRY SYSTEM FOR SEVERE MULTIPATH ACOUSTIC CHANNELS

Jay V. Chase, Jr., Poulsbo, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 13, 1982, Ser. No. 417,784
Int. Cl.³ H04B *11/00*
U.S. Cl. 367—134 **8 Claims**



1. A method of underwater acoustic communication between a transmitting location and a receiving location in the presence of multipath signals, which comprises:

(a) transmitting a predetermined multibit identity code in a string of individual tone bursts, a logical zero being represented by a tone burst at a first acoustic frequency and a logical one being represented by a tone burst at a second acoustic frequency, the spacing between consecutive identity code tone bursts being chosen to allow multipath signals generated by the earlier tone burst to decay to a noninterfering level before transmission of the following identity code tone burst;

(b) transmitting data identified by said identity code in a string of individual tone bursts, a logical zero being represented by a tone burst at a third acoustic frequency and a logical one being represented by a tone burst at a fourth acoustic frequency, the spacing between consecutive data tone bursts being chosen to allow multipath signals generated by the earlier data tone burst to decay to a noninterfering level before transmission of the following data tone burst, said data tone bursts being interleaved with said identity code tone bursts;

(c) receiving the transmitted identity code tone bursts and the transmitted data tone bursts;

(d) determining whether the received identity code tone bursts represent a logical one or a logical zero;

(e) correlating said received identity code with said predetermined multibit identity code to identify the identity code which was received;

(f) determining whether the received data tone bursts represent a logical one or a logical zero; and

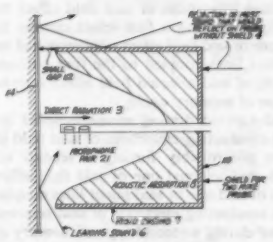
(g) storing the logical value of said data tone bursts, whereby, upon correlation of said identity code, said data is identified by said identity code and is available for further use.

4,463,453

ACOUSTIC INTENSITY MEASUREMENT APPARATUS AND METHOD INCLUDING PROBE HAVING AMBIENT NOISE SHIELD

Robert L. Cohen, and Geir A. Dalan, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1981, Ser. No. 333,546
Int. Cl.³ H04R *1/40*; G01H *3/00*
U.S. Cl. 367—135 **4 Claims**



1. An acoustic intensity probe comprising in combination:

an outer housing having an open end, said housing having a central axis and a sound absorbing chamber within said outer housing; and,

a pair of microphones disposed along said central axis at the open end of said outer housing.

4,463,454

SONAR VIBRATION ISOLATION TRANSDUCER MOUNT

Harold C. Hemond, Ledyard, and William H. Ezell, New London, both of Conn., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 5, 1981, Ser. No. 260,564
Int. Cl.³ H04R 17/00
U.S. Cl. 367—173 17 Claims

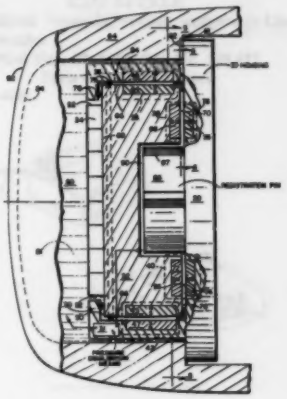
1. A sonar mount for use in a marine vehicle, the vehicle having an outer echo sensitive surface, an inner echo sensitive surface, a chamber; said sonar mount comprising:

a housing, having an aperture and a longitudinal axis normal to said aperture, said chamber containing said housing,

a mount having a longitudinal axis and having a transducer mount surface, a transducer array coupled to said transducer mount surface and having a sensitive axis normal to said transducer mount surface, said mount being positioned within said housing, the longitudinal axis of said mount being relatively parallel to the longitudinal axis of said housing, said sensitive axis of said transducer array being directed toward said inner echo sensitive surface, said transducer array being exposed to said inner echo sensitive surface by said housing aperture,

cooperating sets of magnets attached to said mount and said housing respectively, each set of cooperating magnets having at least one magnet attached to said mount and at least one magnet attached to said housing, each magnet attached to said mount being positioned to mutually repel one or more magnets attached to said housing,

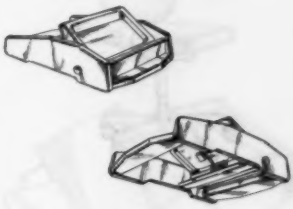
said sets of magnets acting to position said mount to an equilibrium position within said housing, said mount being relatively free of structure born housing vibration transmittal to said mount by a space between said mount and said housing.



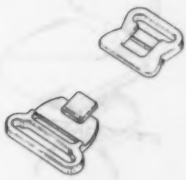
274,859
LOLLIPOP
Linda A. Harris, Los Angeles, and Christopher S. Ross, Hollywood, both of Calif., assignors to Ross and Harris, Inc., Beverly Hills, Calif.
Filed Mar. 8, 1982, Ser. No. 355,390
Term of patent 14 years
U.S. Cl. D1—18

274,860
BELT MOUNTED POCKET FOR A TOOL HOLDER
Roy V. Bladen, Auckland, New Zealand, assignor to Hough Industries Limited, Auckland, New Zealand
Division of Ser. No. 133,680, Mar. 25, 1980. This application Aug. 7, 1981, Ser. No. 291,110
Claims priority, application New Zealand, Oct. 5, 1979, 16282
Term of patent 14 years
U.S. Cl. D2—400

274,861
CAM BUCKLE
Oskar L. Lindblad, Vargarda, Sweden, assignor to Linvent AB, Vargarda, Sweden
Filed Dec. 10, 1981, Ser. No. 329,417
Term of patent 14 years
U.S. Cl. D2—408



274,862
STRAP FASTENER FOR FOUNDATION GARMENTS
Gerhard Fildan, Dieselstr. 20, 7250 Leonberg, Fed. Rep. of Germany
Filed Sep. 14, 1981, Ser. No. 302,312
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1981, MR 475
Term of patent 14 years
U.S. Cl. D2—414



274,863
CHILD'S AUTOMOBILE SEAT
Ingvar L. Lindström, Övernora 6641, 77603 Dala-Husby; Kerstin M. Hagland; Ulf M. Hanses, both of Borganäsv. 20, 78131 Borlänge, and Erik V. Lindgren, Postlåda 1101, 79015 Sundborn, all of Sweden
Filed Dec. 22, 1981, Ser. No. 333,263
Term of patent 14 years
U.S. Cl. D6—333

274,864
CHAIR
Niels Diffrient, Ridgefield, Conn., assignor to Hauserman Inc. Int. Furniture & Textile Div., Norwalk, Conn.
Filed Apr. 29, 1981, Ser. No. 258,787
Term of patent 14 years
U.S. Cl. D6—366

274,865
CHAIR
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,658
Term of patent 14 years
U.S. Cl. D6—360

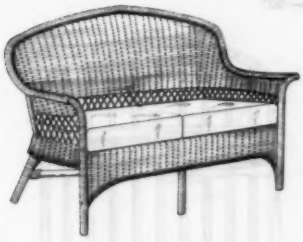
274,866
CHAIR
Edsel E. Murry, Christiana, Tenn., assignor to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,795
Term of patent 14 years
U.S. Cl. D6—366

274,867
SEAT
John W. Caldwell, San Marino, Calif., assignor to Pacific Furniture Mfg. Co., Compton, Calif.
Division of Ser. No. 280,731, Jul. 6, 1981. This application Jan. 11, 1984, Ser. No. 570,044
Term of patent 14 years
U.S. Cl. D6—360

274,868
SWIVEL CHAIR
Carlos L. Lopez-Benitez, Jamestown, N.C., assignor to The Boling Company, Siler City, N.C.
Filed Jan. 4, 1982, Ser. No. 336,888
Term of patent 14 years
U.S. Cl. D6—366

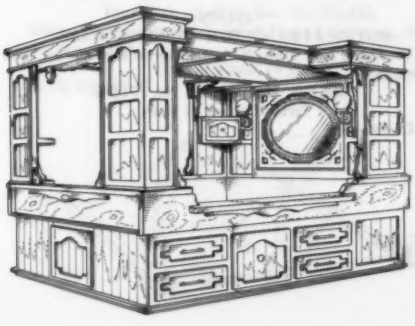
274,869
CHAIR
Robert J. Aronowitz, New York, and Bernard D. Katzanek, Brooklyn, both of N.Y., assignors to Samsonite Corporation, Denver, Colo.
Filed May 27, 1982, Ser. No. 382,796
Term of patent 14 years
U.S. Cl. D6—366

274,870
LOVESEAT
Mike T. Claman, 475 Park Ave., New York, N.Y. 10022
Filed Dec. 24, 1981, Ser. No. 334,385
Term of patent 14 years
U.S. Cl. D6—369

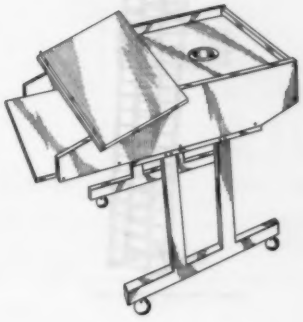


274,871
ARMCHAIR
Jan H. Matthias, Beverly Hills, Calif., assignor to Casa Bella Imports, Inc., Miami, Fla.
Filed Jan. 19, 1982, Ser. No. 340,873
Term of patent 14 years
U.S. Cl. D6—372

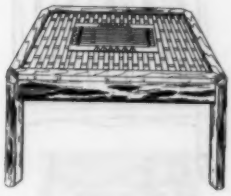
274,872
BED
Floyd R. Slaton, 14384 Cuesta Ct., Sonora, Calif. 95370
Filed Jan. 3, 1984, Ser. No. 567,680
Term of patent 14 years
U.S. Cl. D6—384



274,873
COMPUTER KEY-PUNCH TABLE
Raymond Cope, 3541 Spring Valley Rd., Birmingham, Ala. 35223, and Michael King, 3208 Waxbury La., Birmingham, Ala. 35217
Filed Dec. 7, 1981, Ser. No. 328,457
Term of patent 14 years
U.S. Cl. D6—420

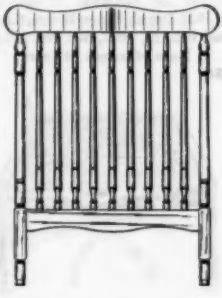


274,874
TABLE
Willie B. Emery, 931 Royal, Baton Rouge, La. 70802
Filed Feb. 22, 1982, Ser. No. 351,337
Term of patent 14 years
U.S. Cl. D6—484

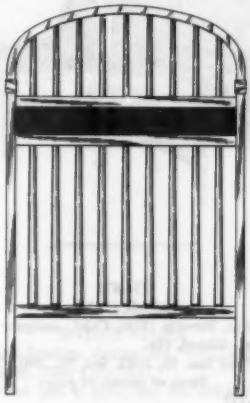


274,875
DISPLAY STAND
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Feb. 22, 1982, Ser. No. 350,700
Term of patent 14 years
U.S. Cl. D6—464

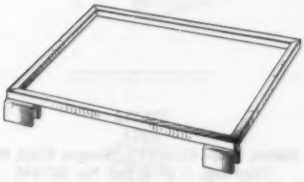
274,876
CRIB END
Henry W. Mower, Stevens Point, Wis.; Allen Seymour, Clayton, Ohio; Jerome P. Koziatek, Hinckley, Ohio, and Joseph G. Lendvay, Ravenna, Ohio, assignors to Questor Corporation, Tampa, Fla.
Filed Apr. 7, 1982, Ser. No. 366,407
Term of patent 14 years
U.S. Cl. D6—508



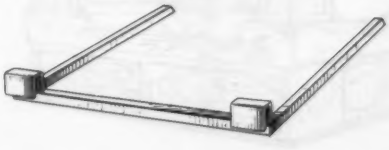
274,877
CRIB END
Henry W. Mower, Stevens Point, Wis.; Allen Seymour, Clayton, Ohio; Jerome P. Koziatek, Hinckley, Ohio, and Joseph G. Lendvay, Ravenna, Ohio, assignors to Questor Corporation, Tampa, Fla.
Filed Apr. 7, 1982, Ser. No. 366,408
Term of patent 14 years
U.S. Cl. D6—507



274,878
TOP FRAME FOR A DISPLAY CASE
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Feb. 22, 1982, Ser. No. 350,709
Term of patent years
U.S. Cl. D6—511

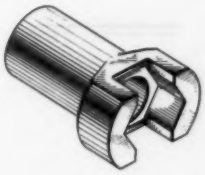


274,879
BOTTOM FRAME FOR A DISPLAY CASE
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Feb. 22, 1982, Ser. No. 351,045
Term of patent 14 years
U.S. Cl. D6—495

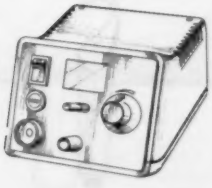


274,880
HOLDER FOR AN ARTICHOKE OR SIMILAR VEGETABLE
Wade Bentson, San Francisco, Calif., assignor to Amco Corporation, Chicago, Ill.
Filed Apr. 17, 1980, Ser. No. 141,115
Term of patent 14 years
U.S. Cl. D7—409

274,881
SOCKET
William R. Wilsey, 140 Penn Am Dr., Quakertown, Pa. 18951
Filed Mar. 25, 1982, Ser. No. 361,745
Term of patent 14 years
U.S. Cl. D8—29



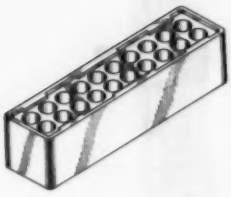
274,882
SOLDERING DEVICE
Günther Rittmann, Lochgau, Fed. Rep. of Germany, assignor to The Cooper Group Deutschland GmbH, Besighaim, Fed. Rep. of Germany
Filed Nov. 13, 1981, Ser. No. 321,316
Claims priority, application Fed. Rep. of Germany, May 13, 1981, Mr 18 189
Term of patent 14 years
U.S. Cl. D8—30



274,883
SEPARABLE MAGNETIC LOCK FOR A PURSE OR SIMILAR ARTICLE
Yoshihiro Aoki, Tokyo, Japan, assignor to Application Art Laboratories Co., Ltd., Tokyo, Japan
Filed Jun. 30, 1981, Ser. No. 279,213
Claims priority, application Japan, Jan. 8, 1981, 56-199
Term of patent 14 years
U.S. Cl. D8—331

274,884
CABLE DRUM
Wolfgang Freitag, Arndtstrasse 10-12, 235 Trappenkamp, Fed. Rep. of Germany
Filed Sep. 17, 1982, Ser. No. 419,609
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, MR 76
Term of patent 14 years
U.S. Cl. D8—359

274,885
PACKAGING CONTAINER FOR AMMUNITION
Joe Joice, St. Peters, Mo., and John Pardo, Yonkers, N.Y., assignors to Olin Corporation, Stamford, Conn.
Filed Jun. 29, 1981, Ser. No. 278,789
Term of patent 14 years
U.S. Cl. D9—341



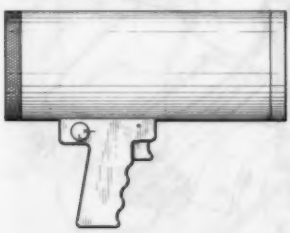
274,886
SQUEEZE BOTTLE FOR LIQUIDS
John P. Capezzuto, Cambridge, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.
Filed Feb. 19, 1982, Ser. No. 350,492
Term of patent 14 years
U.S. Cl. D9—353

274,887
JAR OR THE LIKE
Geoffrey A. Ryder, Welwyn Gdn. City, England, assignor to Deb Chemical Proprietaries Limited, Derbyshire, England
Filed Feb. 10, 1982, Ser. No. 348,372
Claims priority, application United Kingdom, Aug. 15, 1981, 1002008
Term of patent 14 years
U.S. Cl. D9—370

274,888
BOTTLE
Milan Lang, Longueuil, Canada, assignor to Les Promotions Atlantiques, Inc., Longueuil, Canada
Filed Apr. 19, 1982, Ser. No. 369,736
Claims priority, application Canada, Feb. 10, 1982, D-10-02-82-3
Term of patent 14 years
U.S. Cl. D9—381

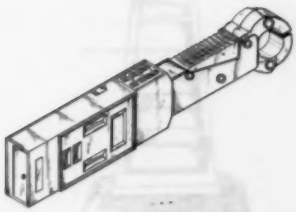
274,889
PIZZA BOX
Richmond Sullivan, 103 Wythe Crescent, Hampton, Va. 23661
Filed Mar. 29, 1982, Ser. No. 362,859
Term of patent 14 years
U.S. Cl. D9—426

274,890
PORTABLE SONAR GUN
Kenneth P. Wilbert; William P. Freymuth; Kyle R. Shelton, and James W. Boling, all of Tulsa, Okla., assignors to Wilbert Enterprises, Inc.; Sebastian Technologies Inc. and General Design, Inc., all of Tulsa, Okla.
Filed Jan. 25, 1982, Ser. No. 342,115
Term of patent 14 years
U.S. Cl. D10—46



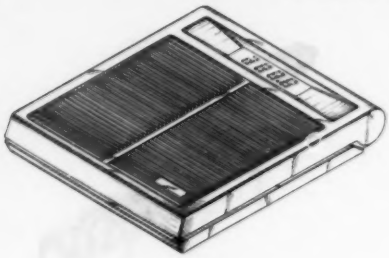
274,891
MICROMETER
Takeshi Yamamoto; Hiroshi Yamashiro, and Tokuzo Nakaoki, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Feb. 17, 1982, Ser. No. 349,195
Claims priority, application Japan, Sep. 4, 1981, 56-39105
Term of patent 14 years
U.S. Cl. D10—73

274,892
ELECTRICAL SENSING AND MEASURING INSTRUMENT
Edward G. Fallon, Hamilton County, and Merle C. Cox, Marion County, both of Ind., assignors to Esterline Angus Instrument Corp., Indianapolis, Ind.
Filed Feb. 26, 1982, Ser. No. 352,651
Term of patent 14 years
U.S. Cl. D10—79



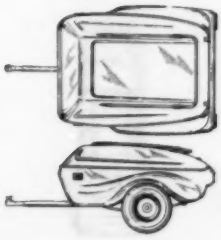
274,893
ELECTRICAL MEASURING INSTRUMENT
Edward G. Fallon, Hamilton County, and Merle C. Cox, Marion County, both of Ind., assignors to Esterline Angus Instrument Corp., Indianapolis, Ind.
Filed Feb. 26, 1982, Ser. No. 352,649
Term of patent 14 years
U.S. Cl. D10—78

274,894
DIGITAL WEIGHT SCALE
John T. Houlihan, Watertown, and Alvaro Correa, Cheshire, both of Conn., assignors to Timex Medical Products Corporation, Waterbury, Conn.
Filed Oct. 12, 1982, Ser. No. 433,948
Term of patent 14 years
U.S. Cl. D10—92

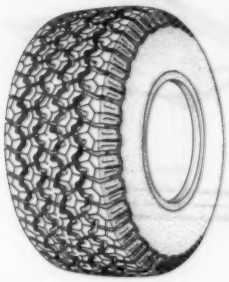


274,895
ROAD MARKER
Kurt Schwab, Mils, Austria, assignor to D. Swarovski & Co., Wattens, Austria
Filed Jan. 28, 1982, Ser. No. 343,473
Claims priority, application Austria, Jul. 29, 1981, 14231
Term of patent 14 years
U.S. Cl. D10—109

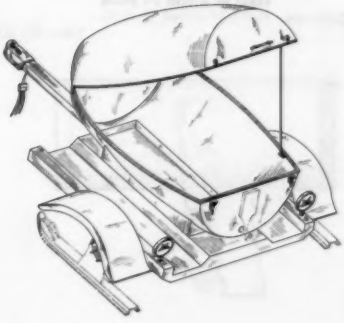
274,896
MOTORCYCLE TRAILER
Eugene L. Wilson, 19696 Mahogany, Bend, Oreg. 97702
Filed Apr. 5, 1982, Ser. No. 365,363
Term of patent 14 years
U.S. Cl. D12—102



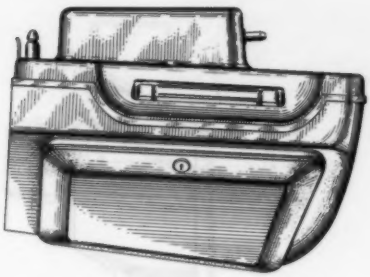
274,897
TIRE
Richard J. Skeri, Barberton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Aug. 31, 1981, Ser. No. 297,600
Term of patent 14 years
U.S. Cl. D12—147



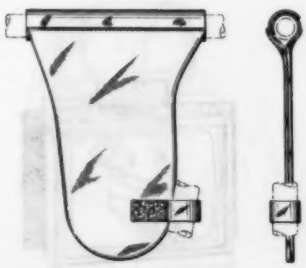
274,898
CONVERTIBLE TRAILER FOR USE WITH RUNNERS OR WHEELS
Gene F. Van Gerpen, P.O. Box 1285, Marble Falls, Tex. 78654
Filed Feb. 1, 1982, Ser. No. 344,582
Term of patent 14 years
U.S. Cl. D12—102



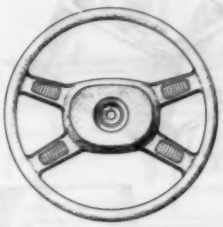
274,899
MOTORCYCLE ARTICLE CARRIER
Charles M. Perethian, Santa Margarita; Kenneth W. Cummings, and Steven J. Posson, both of San Luis Obispo, all of Calif., assignors to First Champaign Corporation, Rantoul, Ill.
Filed Aug. 11, 1980, Ser. No. 176,851
Term of patent 14 years
U.S. Cl. D12—158



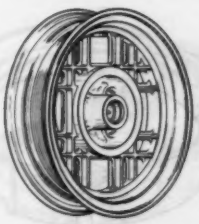
274,900
BAG ATTACHABLE TO BICYCLES OR THE LIKE
Richard S. Canter, 59 Nassau Dr., Great Neck, L.I., N.Y. 11021
Filed Mar. 8, 1982, Ser. No. 355,909
Term of patent 14 years
U.S. Cl. D12—158



274,901
STEERING WHEEL
Claus Luthe, Munich; Manfred Rennen, Ingolstadt, and Hans Braun, Lohhof, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany
Filed Mar. 26, 1981, Ser. No. 247,913
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, MR 12 272
Term of patent 14 years
U.S. Cl. D12—176



274,902
MOTOR CYCLE WHEEL
Ketaro Ito, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 26, 1982, Ser. No. 352,972
Claims priority, application Japan, Sep. 2, 1981, 56-38779
Term of patent 14 years
U.S. Cl. D12—211



274,903

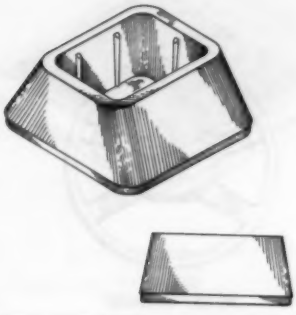
BATTERY CHARGING UNIT OR SIMILAR ARTICLE

John A. Eckmann, Pompano Beach, and Bruce A. Claxton, Coral Springs, both of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 3, 1981, Ser. No. 327,303

Term of patent 14 years

U.S. Cl. D13—5



274,904

MOUNTING RING FOR PREFABRICATED FIRE WALL LEAD-IN

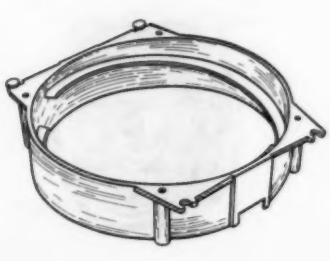
Bengt E. Legerius, Nyköping, and Hans W. Siebert, Oxelösund, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sep. 5, 1980, Ser. No. 184,228

Claims priority, application Sweden, Mar. 14, 1980, 80000535

Term of patent 14 years

U.S. Cl. D13—13



274,905

VIDEO DISC CADDY

James H. Rainey, Danville, and Charles D. Boltz, Greenwood, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,501

Term of patent 14 years

U.S. Cl. D14—1

274,906

TELEVISION RECEIVER

Masahiro Kawanabe, Tokyo; Yasuhiko Matsumoto, Narashino, and Nobuhiro Umehara, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 5, 1982, Ser. No. 346,233

Claims priority, application Japan, Aug. 13, 1981, 56/35486

Term of patent 14 years

U.S. Cl. D14—81

274,907

FRONT, SIDES & FRONT PORTION OF THE TOP OF A TEXT PROCESSING STATION OR SIMILAR ARTICLE

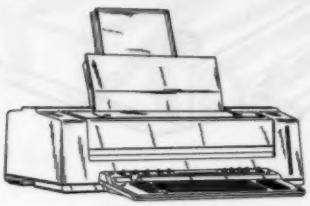
Jens Reese, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 29, 1980, Ser. No. 191,858

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, MR BD. 8 NR. 12 120

Term of patent 14 years

U.S. Cl. D14—100



274,908

MOUNTING BRACKET ASSEMBLY FOR AN OUTBOARD MOTOR

Arthur R. Ferguson, Northbrook, Ill., and Myron T. Stevens, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 30, 1982, Ser. No. 403,468

Term of patent 14 years

U.S. Cl. D15—4

274,909

OUTBOARD MOTOR

Arthur R. Ferguson, Northbrook, Ill., and Myron T. Stevens, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 30, 1982, Ser. No. 403,563

Term of patent 14 years

U.S. Cl. D15—4

274,910

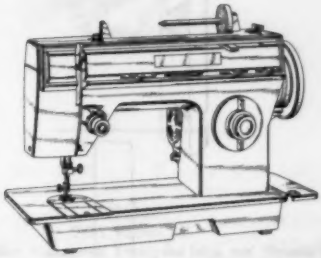
SEWING MACHINE OR SIMILAR ARTICLE

Jan Szostak, Lincroft; George La Police, Somerville, both of N.J.; John Brown, Wilton, Conn., and Michael P. Ballone, New Providence, N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 2, 1981, Ser. No. 326,629

Term of patent 14 years

U.S. Cl. D15—69



274,911

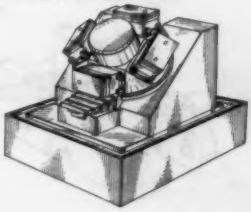
METAL-WORKING MACHINE WITH MULTITOOL HEAD

Mitsuyoshi Sato, Hamamatsu, Japan, assignor to Sakurai, Ltd., Shizuoka, Japan

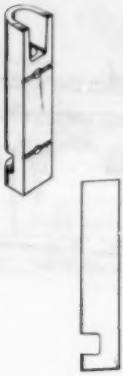
Filed Jan. 15, 1982, Ser. No. 339,335

Term of patent 14 years

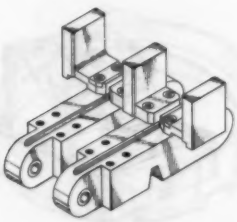
U.S. Cl. D15—122



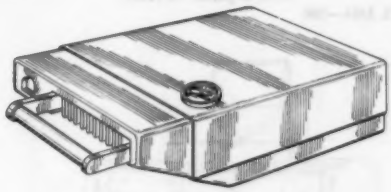
274,912
REFRACTORY TUBE
Gary F. English, and Donald E. Wiley, both of Conneaut, Ohio, assignors to Foseco Trading A.G., Chur, Switzerland
Filed Jan. 7, 1982, Ser. No. 337,867
Claims priority, application United Kingdom, Jul. 24, 1981, 1001645
Term of patent 14 years
U.S. Cl. D15—136



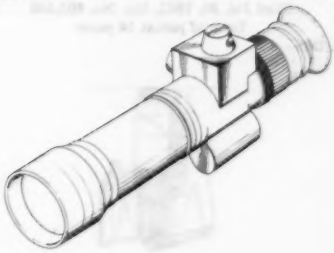
274,913
CHAIN LINK FOR FINGER JOINT MACHINE OR SIMILAR APPARATUS
Charles S. Bonfield, P.O. Box 1208, Medford, Oreg. 97501
Filed Jun. 21, 1982, Ser. No. 390,230
Term of patent 14 years
U.S. Cl. D15—138



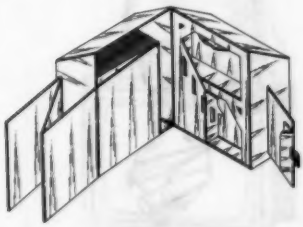
274,914
PORTABLE WELDING MACHINE
Mark H. Bouman, Burnsville, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.
Filed Aug. 19, 1982, Ser. No. 409,726
Term of patent 14 years
U.S. Cl. D15—144



274,915
WEAPON SIGHT
O'Dell M. Keil, Tempe, and Eugene J. Kozell, Mesa, both of Ariz., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Filed Nov. 3, 1980, Ser. No. 203,773
Term of patent 14 years
U.S. Cl. D16—133

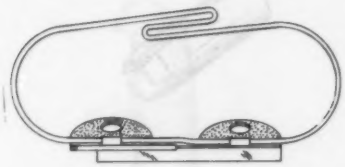


274,916
HOUSE BOOK
Waldo H. Hunt, Encino, Calif., assignor to Intervisual Communications, Inc., Los Angeles, Calif.
Filed Jan. 18, 1982, Ser. No. 339,977
Term of patent 14 years
U.S. Cl. D19—28

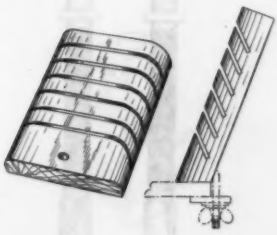


274,917
FOUNTAIN PEN
Daniel Hechter, 62 Avenue Foch, Paris 16ème, France
Filed Oct. 7, 1981, Ser. No. 309,393
Claims priority, application France, Apr. 9, 1981, 811330
Term of patent 14 years
U.S. Cl. D19—51

274,918
VISION RESTRICTOR FOR ATHLETIC TRAINING
James V. Trice, Jr., 15821 Barnesville Rd., Boyds, Md. 20841, and C. Verne Muffoletto, 9411 Flagstone Dr., Baltimore, Md. 21234
Filed May 17, 1982, Ser. No. 379,167
Term of patent 14 years
U.S. Cl. D19—59

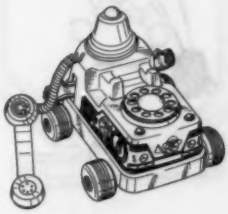


274,919
DRAWING IMPLEMENT HOLDER FOR MOUNTING ON A DRAWING TABLE
Tim Basaldua, Jr., 1911 W. Wabansia Ave., Chicago, Ill. 60622
Filed Jun. 26, 1981, Ser. No. 277,916
Term of patent 14 years
U.S. Cl. D19—75



274,920
PUZZLE
James C. Pendergast, 2118 Florimond Ave., Long Beach, Michigan City, Ind. 46360
Filed Aug. 13, 1982, Ser. No. 407,716
Term of patent 14 years
U.S. Cl. D21—106

274,921
TOY VEHICLE
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Mar. 8, 1982, Ser. No. 356,072
Claims priority, application Japan, Dec. 7, 1981, 56-54112
Term of patent 14 years
U.S. Cl. D21—111

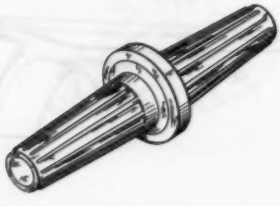


274,922
GUN FOR ELASTIC MISSILES
Wayne G. Smith, 10129 Lowell Ave., Overland Park, Kans. 66212
Filed Feb. 8, 1982, Ser. No. 346,494
Term of patent 14 years
U.S. Cl. D21—147

274,923
TOY BEAR FOOTBALL PLAYER
Seito Ikeda, 1341 Moi Way, Honolulu, Hi. 96816
Filed Feb. 8, 1982, Ser. No. 346,928
Term of patent 14 years
U.S. Cl. D21—159

274,924
PLUSH DOLL
Roseann Radosevich, New Bedford, Mass., and David V. O'Connell, East Providence, R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Apr. 26, 1982, Ser. No. 372,223
Term of patent 14 years
U.S. Cl. D21—167

274,925
MANUAL EXERCISER
Donald E. Holcomb, 7001 W. Palmer Lake Dr., Brooklyn Center, Minn. 55429
Filed May 3, 1982, Ser. No. 374,343
Term of patent 14 years
U.S. Cl. D21—198



274,926
FIREARM
Paul S. Giragosian, 66 Lake St., Arlington, Mass. 02174
Filed Sep. 24, 1982, Ser. No. 423,475
Term of patent 14 years
U.S. Cl. D22—1

274,927
FIREARM CHAMBER PLUG
Francis W. Child, Southfork - Star Rte., Cody, Wyo. 82414
Filed Mar. 17, 1982, Ser. No. 358,893
Term of patent 14 years
U.S. Cl. D22—7

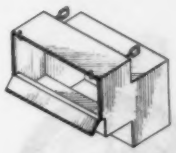
274,928
NUNCHAKU
Kevin D. Orcutt, 5073 E. 111th Pl., Thornton, Colo. 80233
Filed Jul. 12, 1982, Ser. No. 397,241
Term of patent 14 years
U.S. Cl. D22—99

274,929
COMBINED WATER TREATMENT AND STORAGE UNIT
Stephen H. Davis, Dayton, and Randy R. Stephens, Fairfield, both of Ohio, assignors to Water Refining Company, Inc., Middletown, Ohio
Filed Apr. 21, 1983, Ser. No. 487,497
Term of patent 14 years
U.S. Cl. D23—3

274,930
WATER FILTER UNIT
Marcon Joe, 2735 San Clemente Ter., San Diego, Calif. 92122
Filed Nov. 17, 1982, Ser. No. 442,370
Term of patent 14 years
U.S. Cl. D23—4

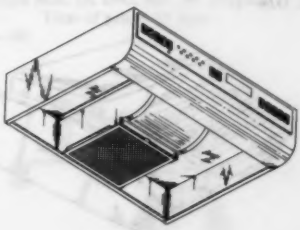
274,931
STOVE
Paul W. Runquist, 1030 Neil Creek Rd., Ashland, Oreg. 97520
Filed Dec. 29, 1981, Ser. No. 335,713
Term of patent 14 years
U.S. Cl. D23—97

274,932
DUST-FREE ASH REMOVER
Gilbert A. Goodwin, Rte. 1, Box 324, Chapin, S.C. 29036
Filed Jun. 23, 1982, Ser. No. 390,998
Term of patent 14 years
U.S. Cl. D23—131

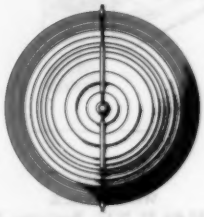


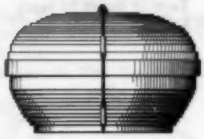
274,933
WOOD RACK
Jerry B. Nau, 3930 4th Pl. N.W., Rochester, Minn. 55901
Filed Jun. 7, 1982, Ser. No. 385,723
Term of patent 14 years
U.S. Cl. D23—138.5

274,934
COMBINED CONTROL PANEL AND RANGE HOOD FOR RECREATIONAL VEHICLES
Edwin F. Johnson, 1331 N. Lincoln Ave., Fullerton, Calif. 92631
Filed Jun. 6, 1983, Ser. No. 501,141
Term of patent 14 years
U.S. Cl. D23—151

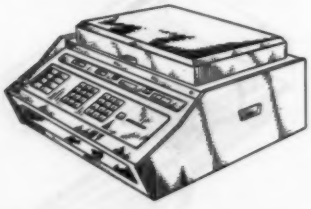


274,935
COVER FOR A TURBINE ROOF VENTILATOR
John H. Tanges, Jr., 901 N. Beach St., Ormond Beach, Fla. 32074
Filed Jun. 25, 1982, Ser. No. 392,251
Term of patent 14 years
U.S. Cl. D23—163

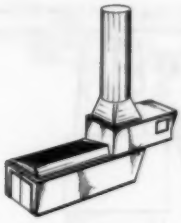




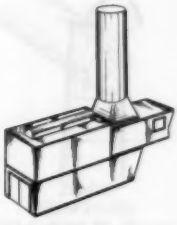
274,936
CLOT DETECTION APPARATUS
Warren J. Bonney, Yardley, Pa., assignor to Warner-Lambert Co., Morris Plains, N.J.
Filed Oct. 26, 1981, Ser. No. 315,078
Term of patent 14 years
U.S. Cl. D24—17



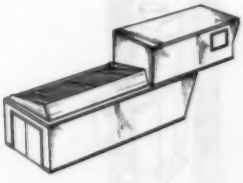
274,937
CONCRETE SUPPLY STATION
Sture Boström, Umeå, Sweden, assignor to AB Röbäcks Mekaniska, Umeå, Sweden
Filed May 4, 1982, Ser. No. 374,629
Claims priority, application Sweden, Nov. 6, 1981, 81-2557
Term of patent 14 years
U.S. Cl. D25—3



274,938
CONCRETE SUPPLY STATION
Sture Boström, Umeå, Sweden, assignor to AB Röbäcks Mekaniska, Umeå, Sweden
Filed May 4, 1982, Ser. No. 374,643
Claims priority, application Sweden, Nov. 6, 1981, 81-2558
Term of patent 14 years
U.S. Cl. D25—3

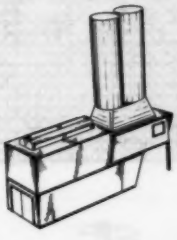


274,939
CONCRETE SUPPLY STATION
Sture Boström, Umeå, Sweden, assignor to AB Röbäcks Mekaniska, Umeå, Sweden
Filed May 4, 1982, Ser. No. 374,644
Claims priority, application Sweden, Nov. 6, 1981, 81-2555
Term of patent 14 years
U.S. Cl. D25—3

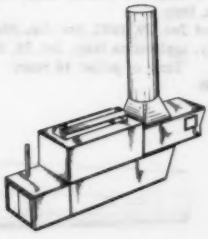


274,940
CONCRETE SUPPLY STATION
Sture Boström, Umeå, Sweden, assignor to AB Röbäcks Mekaniska, Umeå, Sweden
Filed May 4, 1982, Ser. No. 374,645
Claims priority, application Sweden, Nov. 6, 1981, 81-2559
Term of patent 14 years
U.S. Cl. D25—3

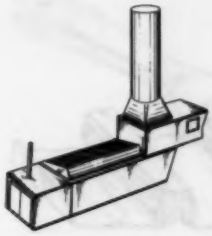
274,941
CONCRETE SUPPLY STATION
Sture Boström, Umeå, Sweden, assignor to AB Röbäcks Mekaniska, Umeå, Sweden
Filed May 4, 1982, Ser. No. 374,713
Claims priority, application Sweden, Nov. 6, 1981, 81-2560
Term of patent 14 years
U.S. Cl. D25—3



274,942
CONCRETE SUPPLY STATION
Sture Boström, Umeå, Sweden, assignor to AB Röbäcks Mekaniska, Umeå, Sweden
Filed May 4, 1982, Ser. No. 374,714
Claims priority, application Sweden, Nov. 6, 1981, 81-2566
Term of patent 14 years
U.S. Cl. D25—3



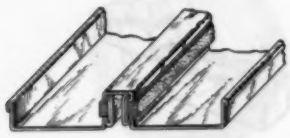
274,943
CONCRETE SUPPLY STATION
Sture Boström, Umeå, Sweden, assignor to AB Röbäcks Mekaniska, Umeå, Sweden
Filed May 4, 1982, Ser. No. 374,716
Claims priority, application Sweden, Nov. 6, 1981, 81-2565
Term of patent 14 years
U.S. Cl. D25—3



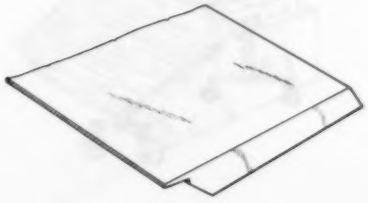
274,944
DECORATIVE SCREEN DOOR
Ciro C. Coppa, 2125 Caddington Dr., San Pedro, Calif. 90732
Filed Jul. 1, 1982, Ser. No. 394,402
Term of patent 14 years
U.S. Cl. D25—48

274,945
MOBILE SUPPORT FOR SCAFFOLDING OR THE LIKE
Jack H. Fitch, 1224 N. 22nd St., Council Bluffs, Iowa 51501
Filed Mar. 15, 1982, Ser. No. 357,852
Term of patent 14 years
U.S. Cl. D25—68

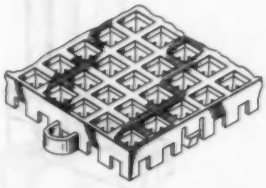
274,946
WEATHERSEAL ASSEMBLY FOR DOUBLE HUNG AND SLIDING WINDOWS
Steven R. Esty, Groveland, Mass., assignor to Amesbury Industries, Inc., Amesbury, Mass.
Filed Apr. 12, 1982, Ser. No. 367,362
Term of patent 14 years
U.S. Cl. D25—73

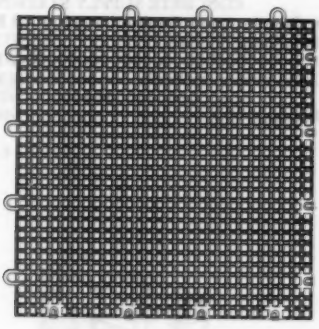


274,947
SINGLE BACKER BOARD SUPPORT FOR SIDING
Bertram C. Culpepper, Jr., 2470 Cranewood, Fenton, Mich. 48430, and Richard C. Wilson, 3269 Bloomfield Park Dr., West Bloomfield, Mich. 48033
Filed Apr. 21, 1982, Ser. No. 370,508
Term of patent 14 years
U.S. Cl. D25—73



274,948
MODULAR GRID SURFACING UNIT
Larry B. Swanson, 108 Tanglewood, Parkersburg, W. Va. 26101, and Dan Kotler, 564 E. 4050 S., Salt Lake City, Utah 84107
Continuation-in-part of Ser. No. 192,439, Oct. 9, 1980. This application Apr. 21, 1982, Ser. No. 370,596
Term of patent 14 years
U.S. Cl. D25—91





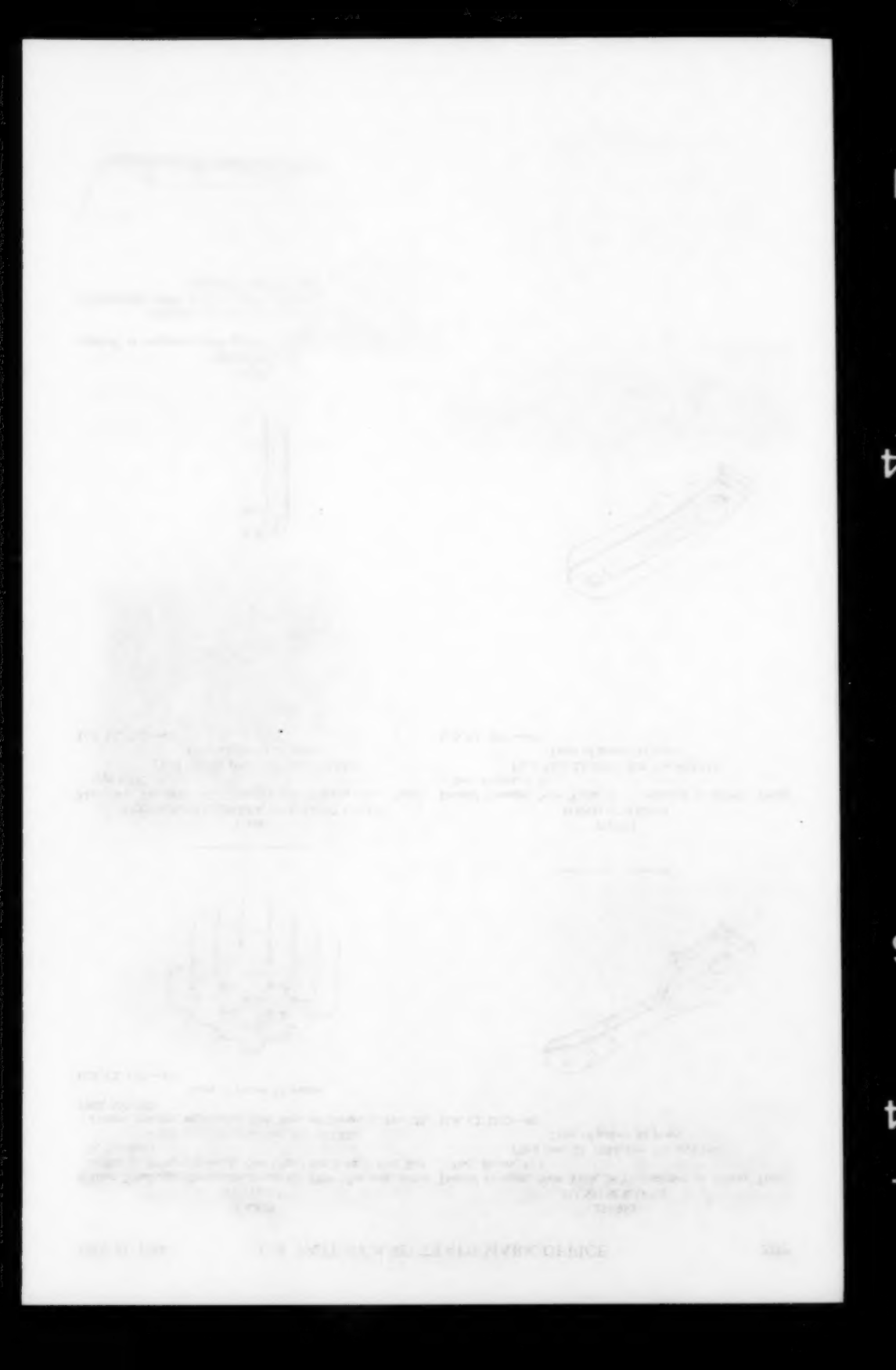
274,949
FLASHLIGHT
Enzo Bandiera, Castiglione Olona, Italy, assignor to Velamp S.p.A., Varese, Italy
Filed Jan. 29, 1982, Ser. No. 344,002
Claims priority, application Italy, Jul. 31, 1981, 22547/81[U]
Term of patent 14 years
U.S. Cl. D26—49

274,950
ASHTRAY
Walter Zeischegg, Blumenscheinweg 10, 7900 Ulm, and Bernd Brüssing, Bilharzstrasse 3, 7900 Ulm-Lehr, both of Fed. Rep. of Germany
Filed Jun. 29, 1982, Ser. No. 393,526
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, MR 955
Term of patent 14 years
U.S. Cl. D27—29

274,951
COMBINED LIGHTER AND CONTAINER
Masahiro Terasaki, 43, Okimiya-cho, Edogawa-ku, Tokyo, Japan 133
Filed Feb. 8, 1982, Ser. No. 346,534
Term of patent 14 years
U.S. Cl. D27—42

274,952
HAND SCRAPER
Donald Gringer, New York, N.Y., assignor to Allway Tools, Inc., Bronx, N.Y.
Filed Dec. 13, 1982, Ser. No. 449,156
Term of patent 14 years
U.S. Cl. D32—48

274,953
HAND SCRAPER
Donald Gringer, New York, N.Y., assignor to Allway Tools, Inc., Bronx, N.Y.
Filed Dec. 13, 1982, Ser. No. 449,157
Term of patent 14 years
U.S. Cl. D32—48



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TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
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A. Schulman, Inc.: *See*—
Nelson, Wayne F., 4,463,054, Cl. 428-458.000.

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Abe, Osamu: *See*—
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Abe, Ryozo: *See*—
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Abel, Allen J.: *See*—
Burgio, Paul A.; Jones, Derrick A.; and Abel, Allen J., 4,462,402, Cl. 128-303.00R.

Abel, Edward P.: *See*—
Bailey, David B.; and Abel, Edward P., 4,463,052, Cl. 428-424.400.

Abler, William L. Single wheel celestial navigator. 4,462,684, Cl. 356-146.000.

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Ruch, Jean; Katryniok, Detlef; Pack, Hugo; and Tillmann, Heinz-Gunther, 4,463,064, Cl. 429-27.000.

ACF Industries, Inc.: *See*—
Muller, J. Joseph, 4,462,359, Cl. 123-339.000.

Acorn Engineering Company: *See*—
Morris, Earl L.; and Hafner, V. Walter, 4,462,123, Cl. 4-286.000.

Adamek, Joachim: *See*—
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Adams, Thomas E. Tank leakage detection method. 4,462,249, Cl. 73-40.50A.

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Adkins, Joey B.; and Frantz, Jack W., to Issa, Darrell E. Anti-theft control system. 4,463,340, Cl. 340-64.000.

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Adlhart, Otto J.; and Feigenbaum, Haim, to Engelhard Corporation. Fuel cell and system for supplying electrolyte thereto. 4,463,066, Cl. 429-34.000.

Adolphi, Heinrich: *See*—
Seufert, Walter; Loeffler, Hans-Peter; and Adolphi, Heinrich, 4,462,997, Cl. 424-217.000.

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Silverstein, Fred E.; and Giuliani, David, 4,462,408, Cl. 128-660.000.

Advani, Gulu N.; Amundson, Scott A.; and Goldfarb, Eli M., to Sierra Monitor Corporation. Percent oxygen gauge. 4,462,246, Cl. 73-23.000.

Aerts, Wilhelmus J.; ter Horst, Gerhardus E. R.; and Linssen, Johannus L. J. M., to Oce-Nederland B.V. Apparatus for producing duplex copies from duplex originals. 4,462,681, Cl. 355-14.0SH.

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Ahrens, Claude W., 4,462,335, Cl. 119-16.000.

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Nomura, Masaaki; Watanabe, Yukihiro; and Yamamoto, Keiiti, 4,462,366, Cl. 123-440.000.
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Kodama, Hisashi, 4,462,364, Cl. 123-90.550.
Murakami, Noboru; and Hasegawa, Hiromi, 4,462,278, Cl. 74-868.000.
Oda, Yukihisa; Sakakibara, Naoji; and Amano, Hiroyuki, 4,463,312, Cl. 324-174.000.

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Luchi, Hartmut; and Mosch, Carl-Wilhelm, 4,463,253, Cl. 250-213.0VT.

Akimoto, Shinichi: *See*—
Mizuno, Mitsuo; Suginaka, Akinori; Fujii, Masahiko; and Akimoto, Shinichi, 4,462,984, Cl. 424-78.000.

Akimune, Yoshio: *See*—
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Akutsu, Mitsuo: *See*—
Nakahara, Yutaka; Akutsu, Mitsuo; Haruna, Tohru; and Takahashi, Masayuki, 4,463,113, Cl. 524-117.000.

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Albert, Anthony P.: *See*—
Feil, Joseph N.; and Albert, Anthony P., 4,462,953, Cl. 264-564.000.

Albert Einstein College of Medicine of Yeshiva University a Division of Yeshiva University: *See*—
Hoberman, Henry D., 4,463,098, Cl. 436-67.000.

Alberta Energy Company Ltd.: *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.

Alberts, Heinrich; and Steinberger, Helmut, to Bayer Aktiengesellschaft. Crosslinkable graft polymer dispersion of organopolysiloxanes containing hydrogen-siloxane groups and Si-vinyl groups. 4,463,127, Cl. 524-731.000.

Albin, Michel; and Pillon, Dominique B., to Framatome. Support device positioned between an element of large mass and a fixed support. 4,462,955, Cl. 376-272.000.

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Egli, Ernst, 4,462,548, Cl. 239-225.000.

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McGeehee, Ronald W., 4,462,759, Cl. 417-46.000.

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Nauman, John D., 4,462,824, Cl. 75-60.000.

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Smith, Carl M., 4,462,785, Cl. 425-387.100.

Allen, James A.: *See*—
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Dytch, Anthony, 4,462,540, Cl. 236-47.000.

Allen, Ronald J., to Illinois Tool Works Inc. Flashing product. 4,462,190, Cl. 52-58.000.

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Gifford, Paul R.; Palmisano, James B.; Shacklette, Lawrence W.; Chance, Ronald R.; and Toth, James E., 4,463,072, Cl. 429-194.000.
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Shacklette, Lawrence W.; Miller, Granville G.; and Frommer, Jane E., 4,462,929, Cl. 252-518.000.
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Altoz, Frank E.; and Chino, John J., to Westinghouse Electric Corp. Attitude independent evaporative cooling system. 4,463,409, Cl. 361-382.000.

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Oda, Yukihisa; Sakakibara, Naoji; and Amano, Hiroyuki, 4,463,312, Cl. 324-174.000.

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AMCA International Corporation: *See*—
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,462,535, Cl. 228-184.000.

American Colloid Company: *See*—
Alexander, William; and Odom, Ira E., 4,462,470, Cl. 175-72.000.

American Cyanamid Company: *See*—
Cohen, Martin L.; Arthen, Frank J., Jr.; and Tseng, Shin-Shyong, 4,462,931, Cl. 252-700.000.

American Home Products Corporation: *See*—
Zabel, Herbert E., 4,462,231, Cl. 70-21.000.

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Fisher, Michael D., 4,462,192, Cl. 52-240.000.

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Legger, Roberto; Amosso, Lorenzo; and Legger, Eligio, 4,462,592, Cl. 273-73.00D.

AMP Incorporated: *See*—
Aiello, Richard E., 4,462,654, Cl. 339-91.00R.

Ampex Corporation: *See*—
Bennett, Phillip P.; and Gabriel, Steven A., 4,463,372, Cl. 358-22.000.

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Smidt, Gary L.; Amundsen, Louis R.; and Herring, Thomas B., 4,462,252, Cl. 73-379.000.

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Nordstrom, Arnold B., 4,462,493, Cl. 193-35.00R.

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Emi, Shigenori; Kojima, Yoshio; and Ando, Makoto, 4,463,095, Cl. 435-190.000.

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Ringer, Richard M., 4,462,853, Cl. 156-238.000.

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Nogami, Sumitaka; Wakabayashi, Tsuneo; Oono, Eiichi; Kitahama, Yoshiharu; and Iwami, Isamu, 4,463,162, Cl. 528-190.000.

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Olson, John G.; and Kmiecik, Joseph C., 4,462,555, Cl. 242-118.600.
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Hood, Paul E.; and Pickens, John O., 4,463,058, Cl. 75-229.000.

Lowther, Frank E., 4,463,214, Cl. 136-208.000.
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Axtmann, Robert C. Desilication of geothermal water. 4,462,905, Cl. 210-189.000.
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Azuma, Kenkoku; Kajita, Isao; and Usui, Akaru, to Mitsubishi Denki Kabushiki Kaisha. Intermittent ozonizing apparatus. 4,462,965, Cl. 422-186.080.
B. F. Goodrich Company, The: *See*—
Barnhouse, James P., 4,463,136, Cl. 525-187.000.
Haylett, Lyle M.; Houck, Robert J.; and King, Kevin J., 4,463,434, Cl. 364-507.000.
Baba, Nobuyuki; and Housako, Keiichi, to Toyo Soda Manufacturing Co., Ltd. Liquid chromatographic flow cell. 4,462,962, Cl. 422-58.000.
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Babcock Electro-Mechanical, Inc.: *See*—
Hurter, Max, 4,463,331, Cl. 335-202.000.
Babcock & Wilcox Company, The: *See*—
Keyes, Marion A.; and Thompson, William L., 4,462,261, Cl. 73-861.020.
Back, Gunter, to Hoechst Aktiengesellschaft. Device for feeding and transporting printing forms. 4,462,678, Cl. 355-3.00R.
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Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.
Bailey, David B.; and Abel, Edward P., to Eastman Kodak Company. Vinyl-ester polymeric timing layer for color transfer assemblages. 4,463,052, Cl. 428-424.400.
Bain, Lawrence J.; Eckerson, Robert D.; and Siniscal, Paul D., to Rockwell International Corporation. Newspaper live storage buffer. 4,462,735, Cl. 414-37.000.
Baird Corporation: *See*—
Brennan, Thomas M.; and Burley, Robert M., 4,463,252, Cl. 250-213.0VT.
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Goans, Kip B., 4,462,301, Cl. 92-48.000.
Baker International Corporation: *See*—
Beimgraben, Herbert W., 4,462,472, Cl. 175-320.000.
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Kabler, Milton N.; Williams, Richard T.; Rife, Jack C.; Hunter, William R.; Kirkland, Johnny P.; and Lien, Neil C., 4,462,689, Cl. 356-333.000.
Baker, Wilford S.; and Harrison, James J., to Gulf Oil Corporation. Cement composition and method of cement casing in a well. 4,462,836, Cl. 106-92.000.
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Balchunis, Robert J.; and Sher, Frank T., to Minnesota Mining and Manufacturing Company. Antistatic films. 4,463,114, Cl. 524-157.000.
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Wood, Charles L., 4,463,416, Cl. 364-143.000.
Ballarin, Jurgen; Cieslik, Detlef; and Reichel, Werner, to Bosch-Siemens Hausgerate GmbH. Cooling appliance, especially a household refrigerator or the like. 4,462,645, Cl. 312-214.000.
Balta, Lucia E.: *See*—
Freckman, William G.; Jakubowski, Zbigniew L.; Bunge, Richard H.; French, James C.; and Balta, Lucia E., 4,463,182, Cl. 549-264.000.
Baltimore Paint & Chemical Co., a division of Dutch Boy, Inc.: *See*—Metz, Mac L., 4,462,547, Cl. 239-130.000.
Bambenek, Charles L.; and Lewitzke, Craig W., to Ford Motor Company. Motor vehicle fill pipe to fuel tank connector. 4,462,620, Cl. 285-162.000.
Barbour, John J.: *See*—
Donbar, Ken W.; Barbour, John J.; Henderson, James N.; and Bell, Anthony J., 4,463,146, Cl. 526-142.000.
Barenz, Manfred: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 4,463,148, Cl. 526-264.000.
Barmag Barmer Maschinenfabrik Ag: *See*—
Hertell, Siegfried, 4,462,302, Cl. 92-248.000.
Barnes, Richard M.: *See*—
Short, Robert D., III; Bennett, Clarence L., Jr.; Barnes, Richard M.; Smith, Robert S.; and Pyle, Harold W., 4,463,356, Cl. 343-7.700.
Barnhill, Alton L. Safety entry latching arrangement. 4,462,625, Cl. 292-259.00R.
Barnhouse, James P., to B. F. Goodrich Company, The. Epihalohydrin polymer blends. 4,463,136, Cl. 525-187.000.
Barnoski, Michael K.: *See*—
Asawa, Charles K.; Barnoski, Michael K.; and Yao, Shi-Kay, 4,463,254, Cl. 250-231.00R.
Baron, Frank C.; Baron, Kevin F.; and Baron, Kraig M. Circular saw for cutting green concrete and asphalt. 4,462,382, Cl. 125-15.000.
Baron, Kevin F.: *See*—
Baron, Frank C.; Baron, Kevin F.; and Baron, Kraig M., 4,462,382, Cl. 125-15.000.
Baron, Kraig M.: *See*—
Baron, Frank C.; Baron, Kevin F.; and Baron, Kraig M., 4,462,382, Cl. 125-15.000.
Baroncelli, Vittorio; Colapicchioni, Claudio; Giannini, Ivo; and Porcelli, Filippo, to Anic S.p.A. Immunofluorescence reagents, and the method for their preparation. 4,463,099, Cl. 436-546.000.
Barozzi, Gian P.: *See*—
Horeschi, Giancarlo; and Barozzi, Gian P., 4,462,709, Cl. 400-314.000.
Barrett, Michael J.: *See*—
Frankel, David G.; and Barrett, Michael J., 4,463,443, Cl. 364-900.000.
Barzen, Thomas J.: *See*—
Kiko, Frederick J.; and Barzen, Thomas J., 4,463,307, Cl. 323-356.000.
Barzuza, Yzhak, to Filtration Water Filters for Agriculture & Industry Ltd. Pipe connector. 4,462,622, Cl. 285-323.000.
BASF Aktiengesellschaft: *See*—
Jettmar, Werner; Olschner, Hans; and Junge, Helmut, 4,462,832, Cl. 106-23.000.
Schlecker, Rainer; Friedrich, Ludwig; and Lenke, Dieter, 4,463,007, Cl. 424-251.000.
Seufert, Walter; Loeffler, Hans-Peter; and Adolphi, Heinrich, 4,462,997, Cl. 424-217.000.
Bash, Ignatius F., to F. S. Brainard & Company. Apparatus for providing an indication of fluid flow through a fluid metering device. 4,462,263, Cl. 73-861.770.
Bassett, James G., Jr.: *See*—
Keenan, William M.; McGarry, Sheldon; and Bassett, James G., Jr., 4,462,574, Cl. 266-45.000.
Bassett, Peter J.; and Verheijen, Augustinus W., to Prutec Limited. Cadmium sulphide solar cell. 4,463,215, Cl. 136-244.000.
Bates, Gordon. Creosote detector. 4,463,346, Cl. 340-540.000.
Batham, John K.: *See*—
Fontaine, Paul I.; Jones, Evan T. R.; and Batham, John K., 4,462,823, Cl. 75-58.000.
Battelle Development Corporation: *See*—
Fiorentino, Robert J.; and Smith, E. Garland, Jr., 4,462,234, Cl. 72-41.000.
Baudex Corp.: *See*—
Matschke, Arthur L., 4,462,706, Cl. 400-124.000.
Bauer Bros. Co., The: *See*—
Wambsgans, Robert O., 4,462,899, Cl. 209-211.000.
Bauer, Robert E.: *See*—
Furr, Samuel T.; and Bauer, Robert E., 4,462,533, Cl. 228-119.000.
Bayer Aktiengesellschaft: *See*—
Alberts, Heinrich; and Steinberger, Helmut, 4,463,127, Cl. 524-731.000.
Gruber, Hermann; and Wellner, Wolfgang, 4,463,126, Cl. 524-589.000.
Prater, Klaus; and Keesen, Heinz, 4,462,926, Cl. 252-315.100.
Serini, Volker; Peters, Horst; Rudolph, Udo; Buekers, Josef; Nouvertne; and Freitag, Dieter, 4,463,130, Cl. 525-67.000.
BBC Brown, Boveri & Company, Limited: *See*—
Perrenoud, Blaise, 4,463,230, Cl. 200-147.00R.
Beard, William O., Jr.; Cupit, Charles R.; and Moyer, Patricia H., to Vulcan Materials Company. Process for the production of perchloroethylene by catalytic oxychlorination. 4,463,200, Cl. 570-224.000.
Becher, Joel P., to Goodyear Tire & Rubber Company, The. Apparatus for mounting a wheel on a balancer. 4,462,253, Cl. 73-487.000.
Beck, Charles E.: *See*—
Hammer, Edward E.; and Beck, Charles E., 4,463,280, Cl. 313-594.000.
Beckwith, Robert N.: *See*—
McCorkle, Kenneth C.; Wells, Horace M.; Scrimshire, Hershell D.; and Beckwith, Robert N., 4,463,023, Cl. 426-270.000.
Beecham Group p.l.c.: *See*—
Gilpin, Martin L., 4,463,010, Cl. 424-270.000.
Beels, Roland F.: *See*—
Messens, Joseph L.; Ville, Frans J.; and Beels, Roland F., 4,463,316, Cl. 324-447.000.
Behme, Klaus-Jurgen: *See*—
Hoffmann, Bernd; and Behme, Klaus-Jurgen, 4,463,189, Cl. 564-2.000.
Beimgraben, Herbert W., to Baker International Corporation. Marine bearing for a downhole drilling apparatus. 4,462,472, Cl. 175-320.000.
Belart, Juan, to ITT Industries, Inc. Hydraulic power booster with a mechanically operated separate brake control valve member. 4,462,300, Cl. 91-384.000.

Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, to DSM Resins B.V. Powder coating. 4,463,140, Cl. 525-438.000.

Bell, Anthony J.: *See*—
Donbar, Ken W.; Barbour, John J.; Henderson, James N.; and Bell, Anthony J., 4,463,146, Cl. 526-142.000.

Bell, Gordon D.: *See*—
Henke, Mitchell C.; Bell, Gordon D.; Smith, Donald P.; and Archer, Virgil L., 4,462,383, Cl. 126-21.00A.

Bell & Howell Company: *See*—
Guenther, Kenneth L.; Zemke, Edward H.; and Warden, Gerald D., 4,462,428, Cl. 137-868.000.

Bell Telephone Laboratories, Incorporated: *See*—
Grimes, Gary J., 4,463,445, Cl. 364-900.000.

Beloit Corporation: *See*—
Matthew, John B., 4,462,900, Cl. 209-243.000.

Bendix Corporation, The: *See*—
Flederbach, Mark; and Gallusser, David O., 4,462,653, Cl. 339-89.00R.
Werth, Dee A.; and Schildkraut, Alan L., 4,462,652, Cl. 339-89.00M.

Bennett, Clarence L., Jr.: *See*—
Short, Robert D., III; Bennett, Clarence L., Jr.; Barnes, Richard M.; Smith, Robert S.; and Pyle, Harold W., 4,463,356, Cl. 343-7.700.

Bennett, Phillip P.; and Gabriel, Steven A., to Ampex Corporation. Spatial transformation system including key signal generator. 4,463,372, Cl. 358-22.000.

Bennett, R. James; and Phillips, Robert A., to Westinghouse Electric Corp. Controller for mechanically actuated device. 4,463,297, Cl. 318-561.000.

Bennewitz, William W., to Centralab Inc. Tactile feel membrane switch assembly. 4,463,234, Cl. 200-159.00B.

Beppu, Norio: *See*—
Fujii, Akira; and Beppu, Norio, 4,462,667, Cl. 354-137.000.

Berelson, Rudolph. Powder dispenser. 4,462,967, Cl. 422-269.000.

Beres, Ernest A.: *See*—
Stavitsky, David; and Beres, Ernest A., 4,462,780, Cl. 425-144.000.

Berfield, Robert C.; and Fegan, Richard M., to Shop-Vac Corporation. Electric vacuum cleaner. 4,462,137, Cl. 15-353.000.

Bergen, Richard F.: *See*—
Gundlach, Robert W.; and Bergen, Richard F., 4,463,363, Cl. 346-159.000.

Berger, Jean P.; and Crothers, Carlyle W., to Northern Telecom Limited. Surface mounted electronic components having pre-applied solder. 4,463,407, Cl. 361-306.000.

Berger, Joseph, to Ciba-Geigy Corporation. Photocrosslinkable polymers having thioetherimidyl side groups. 4,463,139, Cl. 525-329.100.

Berger, Joseph: *See*—
Zweifel, Hans; Berger, Joseph; and Boushard, Hans, 4,463,142, Cl. 525-502.000.

Berndt, Dieter R., to TRP Energy Sensors, Inc. Process for temperature monitoring a substrate. 4,463,051, Cl. 428-323.000.

Berry, Joe R.: *See*—
Langowski, Faustyn C.; Berry, Joe R.; and Priest, Joseph R., 4,462,733, Cl. 414-22.000.

Besecke, Siegmund; Schroeder, Guenter; Ude, Werner; and Wunderlich, Winfried, to Rohm GmbH. Polyarylene esters containing phosphorus. 4,463,159, Cl. 528-167.000.

Beta Corporation: *See*—
Volk, Joseph A., Jr.; and Garner, David, 4,463,430, Cl. 364-468.000.

Bethlehem Steel Corp.: *See*—
Furr, Samuel T.; and Bauer, Robert E., 4,462,533, Cl. 228-119.000.
Schenck, Arthur J.; Hoffman, John P.; and Crossley, Glenn R., 4,463,437, Cl. 364-557.000.

Betts, Robert E.; and Thorn, Lawrence B., to United States of America, Army. Solid propellant sound generator for coagulation of aerosols. 4,462,483, Cl. 181-142.000.

Beu-Tex Corporation: *See*—
Burnthall, Edward V., 4,462,130, Cl. 8-149.100.
Wilson, Julian B., Jr.; and Nusz, Anthony W., 4,462,227, Cl. 68-5.00D.

Beyer, Dieter, to Siemens Aktiengesellschaft. Installation system of labeled conductors including plugs and connecting centers. 4,462,656, Cl. 339-154.00A.

Bhattacharya, Somnath; Chance, Dudley A.; Koopman, Nicholas G.; and Ray, Sudipta K., to International Business Machines Corporation. Layered metal film structures for LSI chip carriers adapted for solder bonding and wire bonding. 4,463,059, Cl. 428-620.000.

Biceroglu, Omer; and Sankey, Bruce M., to Exxon Research & Engineering Co. Combination visbreaking and hydrorefining with recycle of hydrorefined bottoms. 4,462,895, Cl. 208-59.000.

Biek, Paul A., to Dresser Industries, Inc. Power tool with torque reaction bar. 4,462,282, Cl. 81-57.110.

Binasik, Chester S.: *See*—
Vosper, Ralph R.; Spoormaker, Arie W.; Binasik, Chester S.; and Harthun, Norman E., 4,462,795, Cl. 432-29.000.

Biogal Gyogyszergyar: *See*—
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.

Bitaillou, Alex; Masson, Jean; and Lemoine, Jean-Marie, to International Business Machines Corporation. Method of bonding connecting pins to the eyelets of conductors formed on a ceramic substrate. 4,462,534, Cl. 228-180.00A.

Black, James F.; Grudkowski, Thomas W.; and DeMaria, Anthony J., to United Technologies Corporation. Ultra-thin microelectronic pressure sensors. 4,463,336, Cl. 338-4.000.

Black, John W., to Pemco-Kalamazoo, Inc. Wheel bracket assembly having a resilient element with progressively increasing resistance. 4,462,138, Cl. 16-44.000.

Blais, Maurice R.; and Hess, Craig N., to LSE Corp. Spirometer. 4,462,410, Cl. 128-727.000.

Blazey, Richard N.: *See*—
Gilmour, Hugh S. A.; and Blazey, Richard N., 4,463,074, Cl. 430-7.000.

Bloch, Paul. Retractible fly tying bobbin. 4,462,551, Cl. 242-7.190.

Block, Charles; and Mintz, Leon, to Joseph Galkin Corporation. High speed indexing system. 4,462,530, Cl. 226-156.000.

Bloeck, Siegfried, to Swiss Aluminium Ltd. Process for manufacturing a can lid. 4,462,732, Cl. 413-8.000.

Bloom Engineering Company, Inc.: *See*—
Ely, Robert T., 4,462,698, Cl. 374-125.000.

Bly, Kenneth B.; Stark, Terrance L.; and Ludecke, Otto A., to General Motors Corporation. Ceramic monolith particulate trap including filter support. 4,462,812, Cl. 55-502.000.

Bock, Jan: *See*—
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, 4,463,151, Cl. 526-307.500.
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, 4,463,152, Cl. 526-307.500.

Boddy, Ronald L., to King Engineering Corporation. Pressure sensor and method of producing same. 4,462,258, Cl. 73-706.000.

Bodolus, Christopher L.; and Miloscia, William J., to Standard Oil Company, The. Process for the preparation of rubber-modified thermoplastic resins. 4,463,137, Cl. 525-316.000.

Boe, Ove S.: *See*—
Hansen, Borge B.; and Boe, Ove S., 4,462,790, Cl. 431-264.000.

Boeger, Frank W., to Colt Industries Operating Corp. Anti-twist throttle lever. 4,462,268, Cl. 74-519.000.

Boeing Company, The: *See*—
Cohen, Robert L.; and Dalan, Geir A., 4,463,453, Cl. 367-135.000.
Dunstan, Phillip E., 4,462,514, Cl. 198-334.000.
Lewis, Richard W., 4,462,165, Cl. 33-361.000.
McKinney, Maurice E., 4,463,044, Cl. 428-107.000.

Bogardus, Carl R., Jr.; and Thompson, Lawrence C. Cantilevered mandrel assembly. 4,462,787, Cl. 425-402.000.

Bogese, Charles E., to Virginia Plastics Company. Flexible locking clamp used with tubular guard for linear body. 4,462,141, Cl. 24-16.0PB.

Boguslawski, Jan J., to Uniroyal, Inc. Mixer/extruder having selectively variable shearing action therein. 4,462,691, Cl. 366-80.000.

Bohl, Rainer; and Hiller, Dorothee, to Finaler GmbH. Frying pan. 4,462,388, Cl. 126-390.000.

Boiron, Pierre; and Poitrenaud, Pierre, to Framatome. Apparatus for partitioning off the core of a nuclear reactor with removable elements. 4,462,956, Cl. 376-287.000.

Bolinger, Jimmy W.: *See*—
Pollman, Frederic W.; Bolinger, Jimmy W.; and Reynolds, David W., 4,462,210, Cl. 60-444.000.

Boller, Arthur; Schadt, Martin; and Villiger, Alois, to Hoffmann-La Roche Inc. Disubstituted pyrimidines. 4,462,923, Cl. 252-299.610.

Bonifacio, Liborio. Process and composition for treating tumors in mice. 4,462,987, Cl. 424-99.000.

Bonin, John H.: *See*—
Meyer, John W.; Bonin, John H.; and Daniel, Arnold D., Jr., 4,462,739, Cl. 414-217.000.

Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, to Robert Bosch GmbH. Engine knock control supervisory system. 4,462,362, Cl. 123-425.000.

Bonnetain, Yves; and Sibeud, Jean P., to Renault Vehicules Industriels. Road transportation vehicle drive assist process and apparatus. 4,463,427, Cl. 364-442.000.

Bononi, Loris J. Nitroimidazoles having trichomonacidal activity and pharmaceutical compositions thereof. 4,463,012, Cl. 424-273.00R.

Boocock, John R. B.; and Murray, Ronald E., to Du Pont Canada Inc. Recovery of a proteinaceous oat fraction from a dispersion thereof in hydrocarbon solvent. 4,462,939, Cl. 260-112.00R.

Bools, William G., to General Electric Company. Power supply monitor. 4,463,267, Cl. 290-40.00R.

Boorman, Ben: *See*—
Oubridge, Terence J.; and Boorman, Ben, 4,462,868, Cl. 162-280.000.

Boozer, James M.; Franks, Terry E.; and Rothweiler, Richard C., to Square D Company. Intrinsically safe pilot light. 4,463,398, Cl. 361-1.000.

Bordeaux, John J.; and Miller, John D., to Digico. Weight monitoring apparatus. 4,462,474, Cl. 177-48.000.

Borg-Warner Chemicals, Inc.: *See*—
Dalton, William O.; Rinehart, Michael K.; and Sugio, Akitoshi, 4,463,164, Cl. 528-212.000.

Borg-Warner Corporation: *See*—
Smith, Wallace L.; and Ferman, Randal S., 4,462,751, Cl. 415-89.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Ballarin, Jurgen; Cieslik, Detlef; and Reichel, Werner, 4,462,645, Cl. 312-214.000.

Boskamp, Jelles V., to Lever Brothers Company. Enzymatic liquid detergent composition. 4,462,922, Cl. 252-174.120.

Bosse, Frank; and Lage, Karl-Heinz, to Windmoller & Holscher. Method and apparatus for forming Z-shaped folds in a tubular film

and for inserting the latter into a woven tubing. 4,462,431, Cl. 139-13.00R.

Boshard, Hans: *See—*
Zweifel, Hans; Berger, Joseph; and Boshard, Hans, 4,463,142, Cl. 525-502.000.

Bouldin, Eric W., to Drexler Technology Corporation. Reflective optical data storage and laser recording medium. 4,463,089, Cl. 430-617.000.

Boulos, Robert: *See—*
Simons, Elliot; and Boulos, Robert, 4,462,400, Cl. 128-207.160.

Bour, Edmond H. J. P.; and Warnier, Jean M. M., to Stamicarbon B.V. Process for making polytetramethylene adipamide. 4,463,166, Cl. 528-336.000.

Bourke, Robert S.: *See—*
Cragoe, Edward J., Jr.; and Bourke, Robert S., 4,463,208, Cl. 562-462.000.

Bousquet, Gilles: *See—*
Rambert, AndreLes Fontanelles, 10 bis rue Dr.Bonhomme; and Bousquet, Gilles, 4,462,120, Cl. 3-1.911.

Bouwknegt, Jan, to U.S. Philips Corporation. Device for advancing parts contained in magazines. 4,462,737, Cl. 414-118.000.

Bowditch, Philip N., to Charles Stark Draper Laboratory, Inc., The. Method of making a flat plane seam garment. 4,462,118, Cl. 2-243.00R.

Bowen, Robert J.: *See—*
Grenier, Aime J.; and Bowen, Robert J., 4,463,401, Cl. 361-72.000.

Bowman, George E., to National Research Development Corporation. Analysis apparatus. 4,463,261, Cl. 250-339.000.

Boyce, Gary L., to United States of America, Army. Punch press apparatus for perforating explosive sheets. 4,462,288, Cl. 83-128.000.

Boyd, Winnett. Bicycle brake. 4,462,488, Cl. 192-5.000.

Brahme, Anders, to Instrument AB Scanditronix. Neutron collimator. 4,463,266, Cl. 250-505.100.

Brammer, Hartmut; and Kaiser, Harry, to Robert Bosch GmbH. Ignition distributor for internal combustion engine. 4,462,347, Cl. 123-146.50A.

Branning, Merle L.: *See—*
Gross, Anthony E.; Branning, Merle L.; and Fong, Dodd W., 4,462,808, Cl. 44-51.000.

Brannock, Paul H., to Simmons U.S.A. Stabilized mattress border. 4,462,129, Cl. 5-474.000.

Branson, William I.: *See—*
Bushaw, Kenneth A.; Branson, William I.; Rehage, Ted A.; and Shook, Frankie S., 4,463,417, Cl. 364-200.000.

Brasey, Andre: *See—*
Satran, Amir; and Brasey, Andre, 4,462,725, Cl. 407-92.000.

Brauers, Bert; Kierst, Reiner; and Morsbach, Martin, to Goetze AG. Piston ring with annular expander spring. 4,462,602, Cl. 277-139.000.

Braun, David L., to Minnesota Mining and Manufacturing Company. Powered air respirator and cartridge. 4,462,399, Cl. 128-201.250.

Braver, Alvin S., to International Environmental Corporation. Modular air conditioning apparatus. 4,462,460, Cl. 165-26.000.

Braxmeier, Hans: *See—*
Stahlecker, Gerd; and Braxmeier, Hans, 4,462,558, Cl. 242-178.000.

Brazell, James W.: *See—*
Morgan, Kenneth S.; and Brazell, James W., 4,462,605, Cl. 280-242.0WC.

Brehm, Gailon E.: *See—*
Scott, Bentley N.; and Brehm, Gailon E., 4,463,322, Cl. 331-117.00D.

Brennan, Thomas M.; and Burley, Robert M., to Baird Corporation. Night vision goggle system. 4,463,252, Cl. 250-213.0VT.

Bresson, Clarence R.: *See—*
Parlman, Robert M.; and Bresson, Clarence R., 4,462,898, Cl. 209-166.000.

Bridges, Thomas J., to AT&T Bell Laboratories. Laser isotope detection and measurement. 4,462,686, Cl. 356-318.000.

Bridgestone Corporation: *See—*
Kawaguchi, Yasuyoshi; Aoyama, Hideki; and Mineki, Eiji, 4,462,448, Cl. 152-354.00R.

Bridgestone Tire Company Limited: *See—*
Fukunaga, Takeshi; and Tajima, Kunio, 4,462,850, Cl. 156-110.100.
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; Fujimaki, Tatsuo; Yamaguchi, Shinsuke; and Tomita, Seisuke, 4,463,133, Cl. 525-99.000.

Briggin, Edward: *See—*
Katzman, Lawrence; and Briggin, Edward, 4,463,248, Cl. 219-284.000.

Brill, William F., to Halcon SD Group, Inc., The. Preparation of hydrogen peroxide. 4,462,978, Cl. 423-584.000.

Brinegar, Bette L. Decorative panels and method of making same. 4,463,053, Cl. 428-442.000.

Brinkmeier, Friedhelm; and Frommeyer, Heinrich, to Windmoller & Holscher. Apparatus for injecting air or gas into a tubular film bubble. 4,462,779, Cl. 425-140.000.

British-American Tobacco Company Limited: *See—*
Cronshaw, Arnold W., 4,462,248, Cl. 73-38.000.

Broach, Ronald W. Illuminated shoe skate attachment. 4,463,412, Cl. 362-61.000.

Brocklehurst, Charles E., to Opelika Manufacturing Corporation. Sheet production system with hem expander. 4,462,322, Cl. 112-141.000.

Brockmeyer, Rudolf: *See—*
Grunewald, Peter; and Brockmeyer, Rudolf, 4,462,299, Cl. 89-24.000.

Broeils, John, to Maddak, Inc. Raised superimposed toilet seat and securing clamp. 4,462,122, Cl. 4-239.000.

Broman, David K. Disposable animal trap. 4,462,181, Cl. 43-61.000.

Bromley, Eric; and Schenck, Robert A., to Coleco, Industries, Inc. Video game with control of rate of movement of game objects. 4,462,594, Cl. 273-85.00G.

Bronchart, Robert D. E. M.: *See—*
Lepain, Andre; and Bronchart, Robert D. E. M., 4,462,910, Cl. 210-610.000.

Brooks, Howard L.: *See—*
Collins, Wendell; and Brooks, Howard L., 4,463,120, Cl. 524-274.000.

Brown, Harold D.; Rohling, Leon J.; and Brown, Mark A., to Brown, Harold D. Wellhead with hydraulic pump actuator. 4,462,464, Cl. 166-68.500.

Brown, Mark A.: *See—*
Brown, Harold D.; Rohling, Leon J.; and Brown, Mark A., 4,462,464, Cl. 166-68.500.

Brown, Peter W., to Outboard Marine Corporation. Control mechanism for a carburetor. 4,462,945, Cl. 261-50.00R.

Brown, Ralph. Soccer practice device. 4,462,599, Cl. 273-411.000.

Brown, Robert L., to AMF Inc. Fluid motor and telemetry system. 4,462,469, Cl. 175-40.000.

Browne, John M.; and Silverberg, Morton, to Xerox Corporation. Sheet feeding apparatus. 4,462,586, Cl. 271-94.000.

Browne, John P., to Nei Canada Limited. A.C. connection circuit for display or indicator. 4,462,177, Cl. 40-463.000.

Broz, Thomas A.: *See—*
O'Connell, Daniel D.; and Broz, Thomas A., 4,463,039, Cl. 427-421.000.

Bruder, John F.; and Rainwater, Sam L., to Quadri Corporation. Field effect transistor core memory switching system and method. 4,463,449, Cl. 365-196.000.

Bruhm, Ronald R. Garden window with hide-away screen. 4,462,183, Cl. 47-40.000.

Brunelle, Beatrice Y. Drapable head covering. 4,462,117, Cl. 2-202.000.

Brunelle, Dennis S.; and Esakov, Daniel A., to Combustion Engineering, Inc. Pin locator. 4,462,155, Cl. 29-857.000.

Brunhaber, Donald. Mooring line holding device. 4,462,329, Cl. 114-230.000.

BSD Medical Corporation: *See—*
Turner, Paul F., 4,462,412, Cl. 128-804.000.

Bucher, Bernard P.: *See—*
Guerret, Patrick G.; Bucher, Bernard P.; Dostert, Philippe L.; Mocquet, Gisele C.; and Nedelec, Alain L., 4,463,004, Cl. 424-248.500.

Buckau-Walther Aktiengesellschaft: *See—*
Wettengl, Dietmar, 4,462,903, Cl. 210-150.000.

Budenaers, Roland J.: *See—*
Hicks, Robert H.; Senko, Steve M.; Budenaers, Roland J.; and Teno, Richard L., 4,462,208, Cl. 60-286.000.

Buekers, Josef: *See—*
Serini, Volker; Peters, Horst; Rudolph, Udo; Buekers, Josef; Nouvertne; and Freitag, Dieter, 4,463,130, Cl. 525-67.000.

Buesing, Jonathan P.: *See—*
Amundson, Arlon J.; Wurscher, Robert J.; and Buesing, Jonathan P., 4,462,796, Cl. 432-58.000.

Bunge, Richard H.: *See—*
Freckman, William G.; Jakubowski, Zbigniew L.; Bunge, Richard H.; French, James C.; and Balta, Lucia E., 4,463,182, Cl. 549-264.000.

Bunke, Heinz: *See—*
Triebel, Walter; and Bunke, Heinz, 4,463,281, Cl. 313-623.000.

Burgess, Nelson L., to Nel's Laboratory, Inc. Method for the treatment of razor bumps. 4,463,016, Cl. 424-347.000.

Burgio, Paul A., to Minnesota Mining and Manufacturing Company. Method and anchor for anchoring electrode leads used in cochlear implantation. 4,462,401, Cl. 128-303.00R.

Burgio, Paul A.; Jones, Derrick A.; and Abel, Allen J., to Minnesota Mining and Manufacturing Company. Method and anchor for anchoring. 4,462,402, Cl. 128-303.00R.

Burkall, Alvin E.; and Kretchman, Gerald L., to Whirlpool Corporation. Sump for lint screen cleaner and storage system for a dryer. 4,462,170, Cl. 34-82.000.

Burley, Robert M.: *See—*
Brennan, Thomas M.; and Burley, Robert M., 4,463,252, Cl. 250-213.0VT.

Burnham, Robert D.: *See—*
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,462,658, Cl. 350-96.140.

Burnthall, Edward V., to Beu-Tex Corporation. Process for treating textile fibers. 4,462,130, Cl. 8-149.100.

Burroughs Corporation: *See—*
Potash, Hanan; and Green, Howard H., 4,463,423, Cl. 364-300.000.

Buschbom, Floyd E.; and Henke, Donald L., to Veda, Inc. Material mixing apparatus. 4,462,693, Cl. 366-189.000.

Bushaw, Kenneth A.; Branson, William I.; Rehage, Ted A.; and Shook, Frankie S., to International Business Machines Corporation. Modular, processor-controlled document distribution terminal. 4,463,417, Cl. 364-200.000.

Butler, Russell H.: *See—*
Oswald, Hendrikus J.; Li, Hsin L.; and Butler, Russell H., 4,462,143, Cl. 28-257.000.

C. Conradty Nurnberg GmbH & Co. KG: *See—*
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,887, Cl. 204-286.000.
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,888, Cl. 204-286.000.

C.I. Hayes Inc.: *See*—
Westeren, Herbert W., 4,462,577, Cl. 266-250.000.
C. Itoh Feed Mills Co., Ltd.: *See*—
Kawakami, Ryusi; and Masumura, Tadahiro, 4,462,336, Cl. 119-20.000.
C P Components GmbH: *See*—
Custor, Horst, 4,462,852, Cl. 156-231.000.
Caddick, Gary R.; and Guest, Philip Q., Jr., to International Telephone and Telegraph Corporation. Automatic position control for a vehicle seat. 4,463,426, Cl. 364-424.000.
Cahannes, Paul; Dausne, Eduard; and Sarbach, Jurg, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Shattering and incendiary shell containing a projectile body. 4,462,312, Cl. 102-364.000.
Calabro, Anthony D. Adjustable circuit card retainer. 4,462,499, Cl. 211-41.000.
Calcagni, Mario. Extrusion head for extruding mouldings for roller blinds, frames, finish and the like. 4,462,778, Cl. 425-113.000.
Calgon Corporation: *See*—
Smith, Alan L., 4,462,914, Cl. 210-755.000.
Camilleri, Thomas M., to Sycam Advanced Technology Corp. Shock absorbers. 4,462,578, Cl. 267-9.00C.
Campbell, Bruce D.; and Triplett, James T., to Raychem Corporation. Cable preconnectorization apparatus. 4,462,655, Cl. 339-98.000.
Campbell, Leslie T.; Gordon, Frank E.; and Torkelson, Herman, to United States of America, Navy. Current stabilized underwater platform. 4,462,330, Cl. 114-244.000.
Campbell, Willis R.: *See*—
Schlotterbeck, Stephen C.; Uhland, Francis L., Jr.; Campbell, Willis R.; and Freimuth, John H., 4,462,203, Cl. 56-341.000.
Canada-Cities Service, Ltd.: *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy and Natural Resources (Alberta Oil Sands Equity): *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.
Canon Kabushiki Kaisha: *See*—
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 4,463,359, Cl. 346-1.100.
Fujikawa, Kenji; and Hirose, Ryuuho, 4,463,384, Cl. 358-227.000.
Ikeda, Yoshinori, 4,462,680, Cl. 355-14.00D.
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,463,361, Cl. 346-134.000.
Onoda, Shigeyoshi, 4,462,677, Cl. 355-3.00R.
Suzuki, Nobuyuki, 4,462,669, Cl. 354-400.000.
Tamura, Yasuyuki, 4,463,364, Cl. 346-160.000.
Uchidoi, Masanori; and Suzuki, Nobuyuki, 4,462,673, Cl. 354-458.000.
Caplis, Thomas J.; Peck, Carrol E.; and Felton, John C., to Felco, Inc. Material conveyor for use with a backhoe. 4,462,747, Cl. 414-567.000.
Car, Martin, to Otavi Minen AG. Lightweight building material and method of producing the same. 4,462,835, Cl. 106-75.000.
Caramazza, Antonia. Combined tombola and lottery card game. 4,462,597, Cl. 273-296.000.
Carbesu, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., to Ensco, Inc. Waste disposal. 4,462,318, Cl. 110-238.000.
Cardenas, Enrique C.: *See*—
Castellanos, Juan D.; Cardenas, Enrique C.; Kelly, Max B.; Kelly, Lorenzo J.; and Glicken, Irving, 4,462,879, Cl. 204-140.000.
Caretaker Systems, Inc.: *See*—
Pitman, Donald G., 4,462,546, Cl. 239-97.000.
Carles, Jacques; and Lemoyne, Henri, to Groupement Europeen de la Cellulose. Process for the delignification of unbleached chemical pulp. 4,462,864, Cl. 162-56.000.
Carlson, Linda A.; and Morgan, Steven R., to Volleyball World, Inc. Woman's protective undergarment for volleyball. 4,462,115, Cl. 2-2.000.
Carlsson, Valdemar; and Szendroi, Balint, to ITT Industries, Inc. Device for automatic circulation in a waste water pump station. 4,462,766, Cl. 417-430.000.
Caron, Ronald L., to Valley Engineering, Inc. Quick disconnect blade tool mounting apparatus. 4,462,172, Cl. 37-231.000.
Carr, William E. S., to University of Florida. Artificial bait for aquatic species. 4,463,018, Cl. 426-1.000.
Carrier Corporation: *See*—
Gilson, John D., 4,462,539, Cl. 236-13.000.
Carter, Woodward C., II, to Westinghouse Electric Corp. Power controller using dual deadbands for reducing oscillatory load manipulations. 4,463,432, Cl. 364-483.000.
Carty, Edwin J., Jr., to Jukobudo, Inc. Martial arts practice weapon construction. 4,462,593, Cl. 273-84.00R.
Cassella Aktiengesellschaft: *See*—
Engelhardt, Friedrich; Hintermeier, Karl; Smerz, Otto; and Wagener, Hans, 4,463,165, Cl. 528-301.000.
Cassens, Nicholas, Jr., to Kaiser Aluminum & Chemical Corporation. Refractory gun mix. 4,463,100, Cl. 501-108.000.
Castellanos, Juan D.; Cardenas, Enrique C.; Kelly, Max B.; Kelly, Lorenzo J.; and Glicken, Irving, to Mar Industries, Inc. Gold recovery process. 4,462,879, Cl. 204-140.000.
Cavanak, Thomas: *See*—
Azria, Moise; and Cavanak, Thomas, 4,462,983, Cl. 424-45.000.
Cavill, Barry R., to International Business Machines Corporation. Printer control system with controlled acceleration and deceleration. 4,463,435, Cl. 364-519.000.
Ceiling Dynamics, Inc.: *See*—
Sharp, Joseph F., 4,462,198, Cl. 52-667.000.
Celanese Corporation: *See*—
Choe, Eui W.; Conciatori, Anthony B.; and Ward, Bennett C., 4,463,167, Cl. 528-336.000.
Yankowsky, Anthony W.; Stanhope, Harry W.; and Hicks, Darrell D., 4,462,855, Cl. 156-307.300.
Central Illinois Public Service Company: *See*—
Wilhelm, James H., 4,462,969, Cl. 423-242.000.
Centralab Inc.: *See*—
Bennewitz, William W., 4,463,234, Cl. 200-159.00B.
Centre De Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See*—
Crahay, Jean, 4,462,660, Cl. 350-274.000.
Cerami, Anthony, to Evreka, Inc. Method and agents for arresting infection. 4,462,989, Cl. 424-177.000.
Cetus Corporation: *See*—
Hanisch, Wolfgang H.; and Fernandes, Peter M., 4,462,940, Cl. 260-112.00R.
CF Industries, Inc.: *See*—
Satterwhite, William A., 4,462,972, Cl. 423-320.000.
Chabardes, Pierre; and Kuntz, Emile, to Rhone-Poulenc Industries. Process for the preparation of citral. 4,463,196, Cl. 568-450.000.
Chalin, Manuel L.; Chalin, Philip J.; and Chalin, Stuart A. Vanishing target and arrowhead projectile therefor. 4,462,598, Cl. 273-378.000.
Chalin, Philip J.: *See*—
Chalin, Manuel L.; Chalin, Philip J.; and Chalin, Stuart A., 4,462,598, Cl. 273-378.000.
Chalin, Stuart A.: *See*—
Chalin, Manuel L.; Chalin, Philip J.; and Chalin, Stuart A., 4,462,598, Cl. 273-378.000.
Chamberlain, John C.: *See*—
Fritz, William O.; Chamberlain, John C.; and Chandler, Gary C., 4,462,702, Cl. 400-58.000.
Champion International Corporation: *See*—
Gould, Richard J.; and Seiter, George M., 4,462,245, Cl. 73-7.000.
Chance, Dudley A.: *See*—
Bhattacharya, Soenath; Chance, Dudley A.; Koopman, Nicholas G.; and Ray, Sudipta K., 4,463,059, Cl. 428-620.000.
Chance, Ronald R.: *See*—
Gifford, Paul R.; Palmisano, James B.; Shacklette, Lawrence W.; Chance, Ronald R.; and Toth, James E., 4,463,072, Cl. 429-194.000.
Chandler, Gary C.: *See*—
Fritz, William O.; Chamberlain, John C.; and Chandler, Gary C., 4,462,702, Cl. 400-58.000.
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., to Diamond Crystal Salt Company. Meat curing brine. 4,463,026, Cl. 426-652.000.
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., to Diamond Crystal Salt Company. Method of forming a meat curing brine. 4,463,027, Cl. 426-652.000.
Chang, Jaw-Kang: *See*—
Lee, Nancy M.; Loh, Horace H.; and Chang, Jaw-Kang, 4,462,941, Cl. 260-112.50R.
Chang, Robert W. H.: *See*—
Dunshee, Wayne K.; and Chang, Robert W. H., 4,462,224, Cl. 62-530.000.
Chao, Tai-Hsiang: *See*—
Antos, George J.; and Chao, Tai-Hsiang, 4,463,104, Cl. 502-213.000.
Chapman, Earle F., to Chapman Mfg. Co. Inc., a part interest. Swivel stop. 4,462,621, Cl. 285-282.000.
Chapman Mfg. Co. Inc.: *See*—
Chapman, Earle F., 4,462,621, Cl. 285-282.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Bowditch, Philip N., 4,462,118, Cl. 2-243.00R.
Chase, Jay V., Jr., to United States of America, Navy. Tracking and telemetry system for severe multipath acoustic channels. 4,463,452, Cl. 367-134.000.
Chemische Werke Huels AG: *See*—
Disteldorf, Josef; Gras, Rainer; Schnurbusch, Horst; Hubel, Werner; and Wolf, Elmar, 4,463,154, Cl. 528-45.000.
Chen, Ying-Ho: *See*—
Lunsford, Carl D.; and Chen, Ying-Ho, 4,463,190, Cl. 564-349.000.
Chew, Remedios K.: *See*—
Pastor, Ricardo C.; Pastor, Antonio C.; Gorre, Luisa E.; and Chew, Remedios K., 4,462,970, Cl. 423-263.000.
Pastor, Ricardo C.; Pastor, Antonio C.; Gorre, Luisa E.; and Chew, Remedios K., 4,462,974, Cl. 423-335.000.
Chiarottino, Volmer, to Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A. System for providing several data terminals with access to a digital telephone line. 4,463,351, Cl. 340-825.500.
Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,463,002, Cl. 424-246.000.
Chibata, Ichiro; Kisumi, Masahiko; Komatsubara, Saburo; and Murata, Kousaku, to Tanabe Seiyaku Co., Ltd. Fermentation production of L-threonine. 4,463,094, Cl. 435-115.000.
Chino, John J.: *See*—
Altoz, Frank E.; and Chino, John J., 4,463,409, Cl. 361-382.000.
Chiyoda, Tsutomu; Nakamura, Makoto; and Hasegawa, Shinichi, to Sumitomo Chemical Company, Limited. Method for producing phloroglucin. 4,463,199, Cl. 568-768.000.

Chiyoda, Tsutomu: *See*—
Nakamura, Makoto; Chiyoda, Tsutomu; and Hasegawa, Shinichi, 4,463,197, Cl. 568-754.000.

Choe, Eui W.; Conciatori, Anthony B.; and Ward, Bennett C., to Celanese Corporation. Two stage high molecular weight polybenzimidazole production with phosphorus containing catalyst. 4,463,167, Cl. 528-336.000.

Christe, Karl O.: *See*—
Schack, Carl J.; Wilson, William W.; and Christe, Karl O., 4,462,975, Cl. 423-473.000.

Christiansen, Jens H.: *See*—
Meyer-Ebrecht, Dietrich; and Christiansen, Jens H., 4,463,377, Cl. 358-133.000.

Chudinovsky, Anatoly A.: *See*—
Rodkin, Valentin V.; Chudinovsky, Anatoly A.; and Petrova, Valentina V., 4,462,765, Cl. 417-414.000.

Church, John G., to T.I.M.E. Welding Gas Corporation. Welding system. 4,463,243, Cl. 219-74.000.

Ciba-Geigy Corporation: *See*—
Berger, Joseph, 4,463,139, Cl. 525-329.100.
Diethelm, Hermann; and Zahir, Abdul-Cader, 4,463,147, Cl. 526-262.000.
Grade, Reinhardt; and Lorenz, Joachim, 4,462,820, Cl. 71-67.000.
Irving, Edward, 4,463,169, Cl. 528-376.000.
Stingelin, Willy; and Loew, Peter, 4,462,805, Cl. 8-436.000.
Tzikas, Athanassios, 4,463,174, Cl. 544-131.000.
Zweifel, Hans; Berger, Joseph; and Bosshard, Hans, 4,463,142, Cl. 525-502.000.

Cieslik, Detlef: *See*—
Ballarin, Jurgen; Cieslik, Detlef; and Reichel, Werner, 4,462,645, Cl. 312-214.000.

Citrin, David: *See*—
Yung, Tak-Yim; and Citrin, David, 4,462,696, Cl. 368-84.000.

Clarion Co., Ltd.: *See*—
Osaka, Hiroshi; Honma, Akira; and Kanai, Ryokichi, 4,463,376, Cl. 358-120.000.

Clark, James M.: *See*—
Landon, Thomas E.; Secrist, Duane R.; and Clark, James M., 4,462,889, Cl. 204-292.000.

Cleaveland, Mildred S. Sink for seated user. 4,462,126, Cl. 4-619.000.

Cleveland, Joseph J.: *See*—
Wolfe, Robert W.; and Cleveland, Joseph J., 4,462,816, Cl. 65-23.000.
Wolfe, Robert W.; and Cleveland, Joseph J., 4,462,817, Cl. 65-36.000.
Wolfe, Robert W.; and Cleveland, Joseph J., 4,462,818, Cl. 65-36.000.

Coal Industry (Patents) Limited: *See*—
Jayasinghe, Sarath S.; Hooker, Michael A.; and Spencer, Denis H. T., 4,462,807, Cl. 44-1.00R.

Coen Company, Inc.: *See*—
Vosper, Ralph R.; Spoormaker, Arie W.; Binasik, Chester S.; and Harthun, Norman E., 4,462,795, Cl. 432-29.000.

Cohen, Howard; and Pakus, Edward, to Irwin Measuring Tool Company. Illuminated locking tape measure device. 4,462,160, Cl. 33-138.000.

Cohen, Martin L.; Arthen, Frank J., Jr.; and Tseng, Shin-Shyong, to American Cyanamid Company. Enhanced aqueous chemiluminescent systems. 4,462,931, Cl. 252-700.000.

Cohen, Robert L.; and Dalan, Geir A., to Boeing Company, The. Acoustic intensity measurement apparatus and method including probe having ambient noise shield. 4,463,453, Cl. 367-135.000.

Cohn, J. Gunther; Feigenbaum, Haim; and Kaufman, Arthur, to Engelhard Corporation. Fuel cell and system for supplying electrolyte thereto with wick feed. 4,463,068, Cl. 429-34.000.

Colapicchioni, Claudio: *See*—
Baroncelli, Vittorio; Colapicchioni, Claudio; Giannini, Ivo; and Porcelli, Filippo, 4,463,099, Cl. 436-546.000.

Coleco, Industries, Inc.: *See*—
Bromley, Eric; and Schenck, Robert A., 4,462,594, Cl. 273-85.00G.

Colgate, Gilbert, Jr., to United States Banknote Corporation. Method for taxing cigarette packs and validating cigarette cartons. 4,462,851, Cl. 156-212.000.

Colgate Palmolive Company: *See*—
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., 4,462,804, Cl. 8-137.000.

Collet, Marnix G., to U.S. Philips Corporation. Frame-transfer charge-coupled image sensor device having channel sounding regions below light-admitting windows. 4,463,367, Cl. 357-24.000.

Collum, Robert J.; Kaplan, Lester J.; Ludens, James H.; and Von Voigtlander, Philip F., to Upjohn Company, The. Oxygen substituted amino-cyclohexyl-benzeneacetamides and -benzamides as water diuretic drugs. 4,463,013, Cl. 424-274.000.

Collins, Wendell; and Brooks, Howard L., to SWS Silicones Corporation. Process for preparing an aqueous adhesive composition. 4,462,120, Cl. 524-274.000.

Colonna, William J.: *See*—
Horwath, Robert O.; and Colonna, William J., 4,463,093, Cl. 435-94.000.

Colt Industries Operating Corp.: *See*—
Boeger, Frank W., 4,462,268, Cl. 74-519.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; and Kobayashi, Kouichi, 4,462,607, Cl. 280-644.000.

Combustion Engineering, Inc.: *See*—
Brunelle, Dennis S.; and Esakov, Daniel A., 4,462,155, Cl. 29-857.000.

Commissariat a l'Energie Atomique: *See*—
Lemaignan, Clement, 4,462,260, Cl. 73-799.000.

Conciatori, Anthony B.: *See*—
Choe, Eui W.; Conciatori, Anthony B.; and Ward, Bennett C., 4,463,167, Cl. 528-336.000.

Conner, Jack S. Bearing utilizing helical insert. 4,462,644, Cl. 308-207.00R.

Connors, Michael P.: *See*—
Specker, Lawrence J.; Jennings, Thomas J.; and Connors, Michael P., 4,462,563, Cl. 244-122.0AG.

Continental Packaging Company, Inc.: *See*—
Roth, Donald J.; Kubis, Charles S.; and Walter, John, 4,462,504, Cl. 220-214.000.

Continental Scale Corporation: *See*—
Kushmuk, Walter P., 4,462,475, Cl. 177-173.000.

Contreras, Ben, to United States of America, Air Force. Thick film radiation detector. 4,463,262, Cl. 250-349.000.

Conway, Michael W., to Halliburton Company. Method and compositions for fracturing subterranean formations. 4,462,917, Cl. 252-8.55R.

Cooper, Duncan H.; and Egan, Herbert W., Jr., to Wallace Murray Corporation. Friction index modifier for damper. 4,462,270, Cl. 74-574.000.

Cooper, Jerry W.: *See*—
Medford, Richard D.; and Cooper, Jerry W., 4,462,649, Cl. 339-16.00R.

Cooper, Steven R.; Flanders, Thomas W.; and Hughes, David M., to CTS Corporation. Push-push switch. 4,463,231, Cl. 200-153.00J.

Copal Company Limited: *See*—
Kurosu, Tomio; and Yoshikawa, Yukio, 4,462,672, Cl. 354-435.000.

Corbin Pacific Inc.: *See*—
Hanagan, Michael W., 4,462,634, Cl. 297-201.000.

Cordis Corporation: *See*—
DeCote, Robert, Jr., 4,462,406, Cl. 128-419.0PG.
Herscovici, Hari; and Tarjan, Peter P., 4,462,407, Cl. 128-419.0PG.

Cornell-Dubilier Corp.: *See*—
Pitel, Ira J., 4,463,287, Cl. 315-291.000.

Correa, Gustavo A.: *See*—
Smith, Charles F.; Parks, George R.; Correa, Gustavo A.; and Holley, Ralph N., 4,462,714, Cl. 405-55.000.

Cosden Technology, Inc.: *See*—
Lepain, Andre; and Bronchart, Robert D. E. M., 4,462,910, Cl. 210-610.000.
MacLaughlin, Donald; and Fortuna, Vincent, 4,462,849, Cl. 156-73.500.

Cosyns, Jean: *See*—
Derrien, Michel; and Cosyns, Jean, 4,463,206, Cl. 585-483.000.

Cottrell, Gerald G. Safety jumper cable apparatus. 4,463,402, Cl. 361-77.000.

Coursen, David L., to Du Pont de Nemours, E. I., and Company. Apparatus and method for transferring a Bingham solid through a long conduit. 4,462,429, Cl. 137-891.000.

Crafon Medical AB: *See*—
Hakanson, Bo H., 4,463,337, Cl. 338-22.00R.

Cragoe, Edward J., Jr.; and Bourke, Robert S., to Merck & Co., Inc. Treatment of gray matter edema. 4,463,208, Cl. 562-462.000.

Crahay, Jean, to Centre De Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Modulating a laser beam. 4,462,660, Cl. 350-274.000.

Crane Plastics, Inc.: *See*—
Hutchison, Herbert L.; and Rose, Byron W., 4,463,046, Cl. 428-156.000.

Cranston Machinery Co., Inc.: *See*—
Kudlicka, Mark L., 4,462,627, Cl. 294-81.0SF.

Crea, David A.; and Keely, Jerry A., to FMC Corporation. Phosphorus purification. 4,462,973, Cl. 423-322.000.

Creative Products Resource, Associates Ltd.: *See*—
Smith, James A., 4,462,981, Cl. 424-27.000.

Cremer, Gottfried. Cooling zone for a kiln, more specially a roller kiln. 4,462,797, Cl. 432-77.000.

Crichlow, Charles A.: *See*—
Martin, Lawrence L.; Worm, Manfred; and Crichlow, Charles A., 4,462,933, Cl. 260-239.0BD.

Criss, Russell C.: *See*—
Gillery, F. Howard; and Criss, Russell C., 4,462,884, Cl. 204-192.00C.

Critchfield, Frank E.: *See*—
Simroth, Donald W.; Critchfield, Frank E.; and Shook, Edgar G., 4,463,107, Cl. 521-137.000.

Crochet, Michel H.; and Riaudet, Jean-Claude L., to Societe Nationale Industrielle et Aerospatiale. Method and device for determining the threshold of resistance of an electric or electromagnetic equipment to an external electromagnetic aggression. 4,463,309, Cl. 324-57.00R.

Crocker, Roger A.; and Schoolcraft, Jim. Pipe handling apparatus. 4,462,749, Cl. 414-748.000.

Cronin, Michael J., to Lockheed Corporation. Energy efficient ECS powered by a variable voltage/variable frequency power system. 4,462,561, Cl. 244-118.500.

Cronshaw, Arnold W., to British-American Tobacco Company Limited. Automatic pressure/flow device. 4,462,248, Cl. 73-38.000.

Crossley, Glenn R.: *See*—
Schenck, Arthur J.; Hoffman, John P.; and Crossley, Glenn R., 4,463,437, Cl. 364-557.000.

Crothers, Carlyle W.: *See—*
Berger, Jean P.; and Crothers, Carlyle W., 4,463,407, Cl. 361-306.000.
Crown Zellerbach Corporation: *See—*
Reba, Imants, 4,462,722, Cl. 406-154.000.
Weis, Rudolf R.; and Schutz, Rudolph W., 4,462,287, Cl. 83-104.000.
Crudele, Richard E., to Platforms and Power, Inc. Tension sensing device. 4,462,484, Cl. 182-19.000.
$CRYO_2$ Corporation: *See—*
Perkins, Warren E., 4,462,223, Cl. 62-514.00R.
Cselt Centro Studi E Laboratori Telecomunicazioni S.p.A.: *See—*
Chiarottino, Volmer, 4,463,351, Cl. 340-825.500.
Csernus, Istvan: *See—*
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.
CSP, Inc.: *See—*
Storer, James E.; and Waggett, James A., 4,463,422, Cl. 364-300.000.
CTS Corporation: *See—*
Cooper, Steven R.; Flanders, Thomas W.; and Hughes, David M., 4,463,231, Cl. 200-153.00J.
Cullie, Eugene C., to Teledyne Farris Engineering. Safety pressure relief valve. 4,462,420, Cl. 137-488.000.
Cummins, Joseph M., Jr., to University of Illinois Foundation. Delivery of biologically active components of heterologous species interferon isolates. 4,462,985, Cl. 424-85.000.
Cunningham, Ernest R., to Grip-Pak, Inc. Multi-packaging device for cylindrical containers. 4,462,494, Cl. 206-150.000.
Cunningham, Percy C. System for improving synthetic surfaces. 4,462,184, Cl. 47-58.000.
Cupit, Charles R.: *See—*
Beard, William O., Jr.; Cupit, Charles R.; and Moyer, Patricia H., 4,463,200, Cl. 570-224.000.
Custom Equipment Corporation: *See—*
Wilson, Robert A.; and Peterson, J. Leroy, 4,462,870, Cl. 202-124.000.
Custor, Horst, to C P Components GmbH. Process for coloring (printing) of web-like objects, especially ski coverings, as well as similar objects. 4,462,852, Cl. 156-231.000.
Cutters Exchange, Inc.: *See—*
Smith, Hoyt L.; and Farrar, D. Frank, Jr., 4,462,582, Cl. 270-31.000.
Smith, Hoyt L.; and Farrar, D. Frank, Jr., 4,462,583, Cl. 270-31.000.
Smith, Hoyt L.; and Farrar, D. Frank, Jr., 4,462,584, Cl. 270-31.000.
CVI Incorporated: *See—*
Hensley, Steve L., 4,462,419, Cl. 137-340.000.
Cytra, Viktor, to Luxaron Metals Ltd. Rotary charger. 4,462,740, Cl. 414-220.000.
Czinczel, Armin: *See—*
Mohl, Helmut; Schwab, Manfred; Sauer, Joseph; Muller, Alfred; Leiber, Heinz; and Czinczel, Armin, 4,462,275, Cl. 74-866.000.
Czuba, John S.: *See—*
de Mello, F. Paul; Hannett, Louis N.; Parkinson, David W.; and Czuba, John S., 4,463,306, Cl. 322-25.000.
Czyszczewski, Joseph S.; Pascoe, Robert A.; and Stafford, James M., to International Business Machines Corporation. Printing system wherein justification determination is shared between a host processor and a printer. 4,462,701, Cl. 400-3.000.
D. W. Zimmerman Mfg., Inc.: *See—*
Fox, Albert D., 4,462,571, Cl. 254-270.000.
Daane, Robert A., to W. R. Grace & Co. Web dryer solvent vapor control means. 4,462,169, Cl. 34-62.000.
Dachowski, Richard P.; and Motola, Patrick D., to International Business Machines Corporation. Emulation of data processing display terminals of variable screen size on the display of a text processor. 4,463,442, Cl. 364-900.000.
Dagenais, Joseph E. Chain saw with single-wedge, chain-protecting chain support. 4,462,439, Cl. 144-34.00R.
Daimler-Benz Aktiengesellschaft: *See—*
von der Ohe, Manfred, 4,462,609, Cl. 280-690.000.
Dakovski, Lyudmil G.: *See—*
Kassabov, Nikola K.; and Dakovski, Lyudmil G., 4,463,441, Cl. 364-900.000.
Dalan, Geir A.: *See—*
Cohen, Robert L.; and Dalan, Geir A., 4,463,453, Cl. 367-135.000.
D'Alessio, Michael S.; and Safier, Robert S., to Harsco Corporation. Shoring system and parts thereof. 4,462,197, Cl. 52-637.000.
Dalton, William O.; Rinehart, Michael K.; and Sugio, Akitoshi, to Borg-Warner Chemicals, Inc. Process for preparing polyphenylene ethers. 4,463,164, Cl. 528-212.000.
Dana Corporation: *See—*
Joyce, Arthur B., 4,462,148, Cl. 29-447.000.
Danfoss A/S: *See—*
Hansen, Borge B.; and Boe, Ove S., 4,462,790, Cl. 431-264.000.
Thomsen, Svend E.; and Kyster, Erik, 4,462,209, Cl. 60-384.000.
Daniel, Arnold D., Jr.: *See—*
Meyer, John W.; Bonin, John H.; and Daniel, Arnold D., Jr., 4,462,739, Cl. 414-217.000.
Daniels, Paul R.; Moore, Daniel J.; and Nguyen, Ha H., to International Business Machines Corporation. Word processing system having a formatting bidirectional printer. 4,463,444, Cl. 364-900.000.
Danko, Edward A., to Southern California Edison. Method for using alcohol to reduce nitrogen oxides in a fuel gas. 4,462,788, Cl. 431-8.000.
Darden, Jerome W.: *See—*
Peterson, Edward S.; and Darden, Jerome W., 4,462,921, Cl. 252-78.300.
Data Motion, Incorporated: *See—*
Seitz, Alan F., 4,462,531, Cl. 226-171.000.
Daume, Eduard: *See—*
Cahannes, Paul; Daume, Eduard; and Sarbach, Jurg, 4,462,312, Cl. 102-364.000.
Davies, Reg: *See—*
Stevens, William E.; Hill, Joel B., Jr.; and Davies, Reg, 4,462,979, Cl. 423-613.000.
Davis, Gershon J., to Stauffer Chemical Company. Di-aryl monochlorophosphine waste treatment. 4,463,202, Cl. 568-16.000.
Davis, Irwin J.: *See—*
Perlinski, Witold; Davis, Irwin J.; and Romanick, John F., 4,463,110, Cl. 523-409.000.
Davis, Rory R.: *See—*
Hull, Maury L.; and Davis, Rory R., 4,463,433, Cl. 364-506.000.
Davis, Rufus F., Jr.; Marting, Donald G.; and Auvil, Harvey S., to Krupp Wilputte Corporation. Pipeline charging entry into coke ovens. 4,462,869, Cl. 201-40.000.
Davis Tool & Engineering Company, Inc.: *See—*
Inglis, James J., 4,462,269, Cl. 74-572.000.
Davis, Wesley O., Jr.; and Gallo, Ernest, to EPE Corporation. Displacement soldering device. 4,462,532, Cl. 228-40.000.
Dawson, Sylvan L., to Rockwell International Corporation. Automatic gain control circuit. 4,463,320, Cl. 330-279.000.
Dayco Corporation: *See—*
Medford, Richard D.; and Cooper, Jerry W., 4,462,649, Cl. 339-16.00R.
Dazzi, Jean-Louis; and Froment, Jean-Louis, to Renault Vehicules Industriels. Fuel injection apparatus designed for an internal-combustion engine. 4,462,369, Cl. 123-450.000.
Dean, Robert; and Raphael, Paul S., to Mars, Inc. Testing coins. 4,462,513, Cl. 194-100.00A.
DeBortoli, George, to Northern Telecom Limited. Terminating tool for cross-connect connectors for telephone lines. 4,462,153, Cl. 29-760.000.
DeCaro, Aristide R., to North American Philips Lighting Corporation. Compact halogen-cycle incandescent lamp, and lamp unit utilizing such lamp as a light source. 4,463,277, Cl. 313-25.000.
DeCote, Robert, Jr., to Cordis Corporation. Dual channel isolation system for cardiac pacer. 4,462,406, Cl. 128-419.0PG.
Deere & Company: *See—*
Trumbauer, David V., 4,462,453, Cl. 164-32.000.
Deffeyes, Robert J.; and Armstrong, Harris W., to Graham Magnetics Incorporated. Process for forming novel silver powder composition. 4,463,030, Cl. 427-216.000.
DeJager, Everett J.: *See—*
Taylor, Charles W.; and DeJager, Everett J., 4,462,568, Cl. 251-335.00A.
Delalande S.A.: *See—*
Guerret, Patrick G.; Bucher, Bernard P.; Dostert, Philippe L.; Mocquet, Gisele C.; and Nedelec, Alain L., 4,463,004, Cl. 424-248.500.
DeLue, Norman R.; and Korach, Malcolm, to PPG Industries, Inc. Electro organic method and apparatus for carrying out same. 4,462,876, Cl. 204-59.00R.
DeMaria, Anthony J.: *See—*
Black, James F.; Grudkowski, Thomas W.; and DeMaria, Anthony J., 4,463,336, Cl. 338-4.000.
de Mello, F. Paul; Hannett, Louis N.; Parkinson, David W.; and Czuba, John S., to Power Technologies, Inc. System for stabilizing synchronous machines. 4,463,306, Cl. 322-25.000.
Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,463,014, Cl. 424-275.000.
DenBesten, Leroy E. Mining bit with improved split ring retainer. 4,462,638, Cl. 299-86.000.
Dennis, Ronald D.; Dolak, Terence M.; and Kreighbaum, William E., to Mead Johnson & Company. Process for resolution of optical isomers. 4,463,176, Cl. 546-208.000.
Dennison Manufacturing Company: *See—*
Pitts, Warren R., 4,463,365, Cl. 346-163.000.
Russell, David B., 4,462,784, Cl. 425-223.000.
Derrien, Michel; and Cosyns, Jean, to Institut Francais du Petrole. Process for producing benzene by hydrodealkylation of a hydrocarbon fraction comprising alkyl-aromatic hydrocarbons, olefinic hydrocarbons and sulfur compounds. 4,463,206, Cl. 585-483.000.
Desiro, Richard. Radiator recoring fixturing and tools. 4,462,146, Cl. 29-243.500.
Desitech Limited: *See—*
Wiltshire, Antony R., 4,462,285, Cl. 81-468.000.
Detector Electronics Corp.: *See—*
Larsen, Theodore E., 4,462,319, Cl. 110-238.000.
Deutsche Gesellschaft fur Wiederaufarbeitung: *See—*
Stritzke, Detlef, 4,462,200, Cl. 53-467.000.
DeVale, Donald P.; Wilbrandt, Howard B.; Tomlinson, Dennis E.; and Shah, Ashish, to Industrial Design Engineering Associates, Ltd. Computer controlled apparatus for grain elevators. 4,463,429, Cl. 364-466.000.
Diamond Crystal Salt Company: *See—*
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., 4,463,026, Cl. 426-652.000.
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., 4,463,027, Cl. 426-652.000.

Dickson, Lyle C.; Hall, Chester A., Jr.; and Havens, Arthur B., to Owens-Corning Fiberglas Corporation. Manufacturing a laminated pack of mineral fibers and resulting product. 4,463,048, Cl. 428-218.000.

Didier-Werke AG: *See*—
Hohberg, Alfried; and Muschner, Udo, 4,462,576, Cl. 266-220.000.

Diebold Incorporated: *See*—
Anders, Walter G.; and Grosswiller, Leo J., Jr., 4,462,721, Cl. 406-112.000.
Graef, Harry T.; and Wise, Mark J., 4,462,587, Cl. 271-263.000.

Diedrichsen, Allan; Johannessen, Marie; and Tang, Peter, to Novo Industri A/S. Stabilized plasmin compositions and method for preparation thereof. 4,462,980, Cl. 424-1.100.

Diep, Daniel V.; and Grattan, David A., to Nalco Chemical Company. Corrosion inhibited copper nitrate solutions. 4,462,830, Cl. 106-14.140.

Diesel Kiki Company, Ltd.: *See*—
Funada, Takeo, 4,462,368, Cl. 123-446.000.

Diesel Kiki Kabushiki Kaisha: *See*—
Tada, Yoshihara; and Kitano, Yuichi, 4,463,296, Cl. 318-452.000.

Diethelm, Hermann; and Zahir, Abdul-Cader, to Ciba-Geigy Corporation. Heat-curable mixtures, stable on storage, based on polyimides and containing polymerization catalysts. 4,463,147, Cl. 526-262.000.

Digico: *See*—
Bordeaux, John J.; and Miller, John D., 4,462,474, Cl. 177-48.000.

Dignan, Donald J., to Eastern Company, The. Folding foot step. 4,462,486, Cl. 182-91.000.

Digonnet, Michel J. F.: *See*—
Shaw, Herbert J.; and Digonnet, Michel J. F., 4,462,699, Cl. 374-131.000.

Dill, Etienne; and Dill, Pascal. Electronic metronome. 4,462,297, Cl. 84-484.000.

Dill, Pascal: *See*—
Dill, Etienne; and Dill, Pascal, 4,462,297, Cl. 84-484.000.

Dille, Roger M.; Rhodes, Harold A.; and Wallon, Susan B., to Texaco Inc. Partial oxidation of heavy refinery fractions. 4,462,928, Cl. 252-373.000.

Dimit, Richard O.: *See*—
Gilbert, George G.; and Dimit, Richard O., 4,462,643, Cl. 308-202.000.

Dingwall, Andrew G. F., to RCA Corporation. Electronic circuits and structures employing enhancement and depletion type IGFETs. 4,463,273, Cl. 307-450.000.

Dinsmore, Harold L.; and Young, Jon W., Jr., to John Zink Company. Process and apparatus for removing hydrocarboss from air-hydrocarbon vapor mixtures. 4,462,811, Cl. 55-18.000.

Dion, Eric P., to Mobil Oil Corporation. Method for determining the presence of platinum in earth formations. 4,463,256, Cl. 250-256.000.

Di Raffaele, Rudolph; and Spector, George. Beverage container with enclosed straw. 4,462,503, Cl. 220-90.200.

Dirksing, Robert S.; and Yeazell, Bruce A., to Procter & Gamble Company, The. Passageway resistant to capillary transport. 4,462,121, Cl. 4-228.000.

Discovision Associates: *See*—
Golding, Scott M., 4,463,389, Cl. 358-343.000.

Disteldorf, Josef; Gras, Rainer; Schnurbusch, Horst; Hubel, Werner; and Wolf, Elmar, to Chemische Werke Huels AG. Polyurethane powder enamels free of cleavage products as well as enamel coatings produced from such powders. 4,463,154, Cl. 528-45.000.

Dizon, Edmund S.; and Moninski, Joseph P., Jr., to S&C Electric Company. Mounting for an article which permits movement thereof between inaccessible and accessible positions. 4,463,227, Cl. 200-50.00A.

Dr. Alois Stankiewicz Schalischluck GmbH & Co.: *See*—
Kracke, Wilhelm, 4,463,049, Cl. 428-281.000.

Dr. Johannes Heidenhain GmbH: *See*—
Nelle, Guenther, 4,462,159, Cl. 33-125.00C.

Dolak, Terence M.: *See*—
Dennis, Ronald D.; Dolak, Terence M.; and Kreighbaum, William E., 4,463,176, Cl. 546-208.000.

Dolfi, John J. Repeatable dovetail jig. 4,462,440, Cl. 144-144.50R.

Donbar, Ken W.; Barbour, John J.; Henderson, James N.; and Bell, Anthony J., to Goodyear Tire & Rubber Company, The. Syndiotactic 1,2-polybutadiene synthesis process. 4,463,146, Cl. 526-142.000.

Dorr-Oliver Incorporated: *See*—
Eichler, Jack H.; and Landsman, Stephen A., 4,462,908, Cl. 210-237.000.
Kennel, George W., 4,462,909, Cl. 210-525.000.

Dorsch, Dieter, to Grittman, Gunter. Air pump. 4,462,767, Cl. 417-460.000.

Dostert, Philippe L.: *See*—
Guerret, Patrick G.; Bucher, Bernard P.; Dostert, Philippe L.; Mocquet, Gisele C.; and Nedelec, Alain L., 4,463,004, Cl. 424-248.500.

Doty, F. David, to University of South Carolina. Capacitively shortened coaxial resonators for nuclear magnetic resonance signal reception. 4,463,328, Cl. 333-222.000.

Dow Chemical Company, The: *See*—
Ezzell, Bobby R., 4,462,877, Cl. 204-98.000.
Flores, David P.; and Allen, James A., 4,463,122, Cl. 524-322.000.
Flores, David P.; and Allen, James A., 4,463,123, Cl. 524-322.000.
Flores, David P.; and Allen, James A., 4,463,124, Cl. 524-394.000.
Smith, Charles F.; Parks, George R.; Correa, Gustavo A.; and Holley, Ralph N., 4,462,714, Cl. 405-55.000.
Snyder, Kenneth L., Jr.; and Foster, Kenneth L., 4,462,920, Cl. 252-75.000.
Stutts, Kenneth J., 4,462,875, Cl. 204-56.00R.
Walles, Wilhelm E., 4,462,865, Cl. 162-72.000.
Ware, Douglas R.; and Hymas, Theo A., 4,462,995, Cl. 424-200.000.

Downs, Frank J.: *See*—
Pingleton, Robert W.; and Downs, Frank J., 4,462,525, Cl. 224-210.000.

Drag Specialties, Inc.: *See*—
Rudd, Thomas H., 4,462,119, Cl. 2-424.000.

Dragon, Edward S. Gas furnace energy saver. 4,462,385, Cl. 126-112.000.

Drakaliiski, Boris Y.: *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.

Dresser Industries, Inc.: *See*—
Biek, Paul A., 4,462,282, Cl. 81-57.110.

Drexler Technology Corporation: *See*—
Bouldin, Eric W., 4,463,089, Cl. 430-617.000.

Dreyer, Hans; and Muller, Gerald, to Jost-Werke GmbH. Trailer telescopic supporting leg with detachable foot. 4,462,612, Cl. 280-766.100.

Drummond, William E.: *See*—
Simpkins, Gideon M.; and Drummond, William E., 4,463,257, Cl. 250-310.000.

Drushel, Robert W., to Ex-Cell-O Corporation. Electric discharge machine servo control. 4,463,240, Cl. 219-69.00G.

D'Sidocky, Richard M.; and Parker, Dane K., to Goodyear Tire & Rubber Company, The. Process for the reductive alkylation of aromatic nitro-containing compounds with ketones or aldehydes. 4,463,191, Cl. 564-398.000.

DSM Resins B.V.: *See*—
Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, 4,463,140, Cl. 525-438.000.

Du Pont Canada Inc.: *See*—
Boocock, John R. B.; and Murray, Ronald E., 4,462,939, Cl. 260-112.00R.

Dumont, Kenneth R.; and Robinson, Jack R., to Midrex Corporation. Continuous briquet sheet separator. 4,462,526, Cl. 225-4.000.

Dunn, Elman R., to Litton Industrial Products, Inc. Headsetting structure for double disc grinding machine. 4,462,187, Cl. 51-111.00R.

Dunshee, Wayne K.; and Chang, Robert W. H., to Minnesota Mining and Manufacturing Company. Instant hot or cold, reusable cold pack. 4,462,224, Cl. 62-530.000.

Dunstan, Phillip E., to Boeing Company, The. Accelerating and decelerating walkway handrail. 4,462,514, Cl. 198-334.000.

Du Pont de Nemours, E. I., and Company: *See*—
Coursen, David L., 4,462,429, Cl. 137-891.000.
Overman, Joseph D., 4,463,088, Cl. 430-614.000.
Rellick, Joseph R., 4,462,827, Cl. 106-1.190.
Robinson, Ivan M., 4,463,141, Cl. 525-467.000.
Stevens, William E.; Hill, Joel B., Jr.; and Davies, Reg, 4,462,979, Cl. 423-613.000.
Updegraff, Stephen W., 4,463,060, Cl. 428-669.000.
Walker, Francis J., 4,463,103, Cl. 502-159.000.

Duranleau, Roger G.; and McDaniel, Kenneth G., to Texaco Inc. Process for the reduction of an N-hydrocarbyl substituted oxazolidine with carbon monoxide to form the corresponding N-hydrocarbyl substituted alkanolamine. 4,463,192, Cl. 564-467.000.

Durkan, Gerald; and Sieracki, Leonard M., to Kircaldie, Randall and McNab, as trustee. Respirating gas supply method and apparatus therefor. 4,462,398, Cl. 128-200.140.

Dwyer, Francis G.; and Garwood, William E., to Mobil Oil Corporation. Catalyst for converting synthesis gas to high octane predominantly olefinic naphtha. 4,463,101, Cl. 502-74.000.

Dytch, Anthony, to Allen-Martin Electronics Limited. Control system for an air temperature changing unit. 4,462,540, Cl. 236-47.000.

E. R. Squibb & Sons, Inc.: *See*—
Haslanger, Martin F.; and Nakane, Masami, 4,463,015, Cl. 424-285.000.
Haslanger, Martin F., 4,463,183, Cl. 549-311.000.
Petrillo, Edward W., Jr.; Gordon, Eric M.; Krapcho, John; and Sprague, Peter W., 4,462,943, Cl. 260-112.50R.

E-Systems, Inc.: *See*—
Horner, Jimmy M., 4,463,321, Cl. 331-1.00R.

Earl, T. Desmond, to United States of America, Air Force. Airplane take-off system. 4,462,560, Cl. 244-63.000.

Early California Foods, Inc.: *See*—
McCorkle, Kenneth C.; Wells, Horace M.; Scrimshire, Hershell D.; and Beckwith, Robert N., 4,463,023, Cl. 426-270.000.

Eastern Company, The: *See*—
Dignan, Donald J., 4,462,486, Cl. 182-91.000.

Eastman Kodak Company: *See*—
Bailey, David B.; and Abel, Edward P., 4,463,052, Cl. 428-424.400.
Gilmour, Hugh S. A.; and Blazey, Richard N., 4,463,074, Cl. 430-7.000.
Link, Steven G.; and Webster, Frank G., 4,463,076, Cl. 430-37.000.
Maskasky, Joe E., 4,463,087, Cl. 430-567.000.
Michno, Drake M., 4,463,081, Cl. 430-218.000.
Noonan, John M.; and Perlstein, Jerome H., 4,463,078, Cl. 430-73.000.
Powell, Philip G.; and Sharman, Richard A., 4,463,381, Cl. 358-166.000.
Snow, Robert A.; and Klein, Gerald W., 4,463,080, Cl. 430-213.000.

Eaton Corporation: *See*—
Morscheck, Timothy J., 4,462,489, Cl. 192-53.00E.
Mueller, Robert S., 4,462,492, Cl. 192-3.290.
Snowdon, Albert C.; Forsell, Kenneth A.; Theisen, Peter J.; Zarling, Emil W.; and Porter, David G., 4,462,657, Cl. 339-256.00S.

Ebara Corporation: *See*—
Ito, Kanichi; Hirayama, Yoshio; and Takeuchi, Ryoichi, 4,462,695, Cl. 366-345.000.

Ecabert, Jacques; and Aillet, Guy, to Societe d'Exploitation des Etablissements. Multi-element filter with rotary backwash arm. 4,462,916, Cl. 210-798.000.

Eckerson, Robert D.: *See*—
Bain, Lawrence J.; Eckerson, Robert D.; and Siniscal, Paul D., 4,462,735, Cl. 414-37.000.

Eckert, Rolf, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cylinder for reciprocating piston engines. 4,462,343, Cl. 123-41.690.

Economics Laboratory, Inc.: *See*—
Mehus, Richard J., 4,462,425, Cl. 137-624.180.

Edanami, Kozo: *See*—
Kajiura, Koichi; Edanami, Kozo; Onoki, Seiji; Izumina, Tatsuya; and Kumeda, Yasuo, 4,463,350, Cl. 340-825.010.

Edwards, John V.: *See*—
Steer, Peter L.; and Edwards, John V., 4,462,510, Cl. 222-48.000.

Egan, Herbert W., Jr.: *See*—
Cooper, Duncan H.; and Egan, Herbert W., Jr., 4,462,270, Cl. 74-574.000.

Egger, Hans R.; and Vogler, Rudolf, to Intradym Maschinen AG. Concrete gun. 4,462,719, Cl. 406-64.000.

Eggers, Fredrick W., to Federal Signal Corporation. Flash lamp. 4,463,282, Cl. 315-70.000.

Egli, Ernst, to Aliva Aktiengesellschaft. Injector, in particular for injecting concrete. 4,462,548, Cl. 239-225.000.

Ehrlich, Joseph C. Blood letting apparatus. 4,462,405, Cl. 128-329.00R.

Eichler, Jack H.; and Landsman, Stephen A., to Dorr-Oliver Incorporated. Rake lifting means for sedimentation apparatus. 4,462,908, Cl. 210-237.000.

Eisendrath, Charles R. Adjustable cooking grill. 4,462,306, Cl. 99-340.000.

Eldon Industries, Inc.: *See*—
Lawrence, William; and Gaines, Jack, 4,463,247, Cl. 219-236.000.

Electrak International Limited: *See*—
Humphreys, Michael, 4,462,650, Cl. 339-22.00R.

Electric Power Research Institute, Inc.: *See*—
Koch, Robert E.; and Stetson, Earl W., 4,463,405, Cl. 361-135.000.

Eli Lilly and Company: *See*—
Hamill, Robert L.; and Kastner, Ralph E., 4,462,942, Cl. 260-112.50R.
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., 4,463,092, Cl. 435-70.000.
Morwick, Tina M.; and Wikel, James H., 4,463,181, Cl. 548-306.000.

Ellis, Edward J., to Polymer Technology Corporation. Silicone-containing contact lens material and contact lenses made thereof. 4,463,149, Cl. 526-279.000.

Elrick, Donald E., to Hercules Incorporated. Slurry casting method for double base propellants. 4,462,848, Cl. 149-19.920.

Eltreva AG: *See*—
Schmidlin, Hans, 4,462,459, Cl. 165-54.000.

Ely, Robert T., to Bloom Engineering Company, Inc. Noncontact temperature sensing method and apparatus for ladle preheating. 4,462,698, Cl. 374-125.000.

Ema, Sumio: *See*—
Saito, Tetsuo; and Ema, Sumio, 4,462,610, Cl. 280-707.000.

Emi, Shigenori; Kojima, Yoshio; and Ando, Makoto, to Toyo Boseki Kabushiki Kaisha. Process for producing α-glycerophosphate oxidase. 4,463,095, Cl. 435-190.000.

Energy Conversion Devices, Inc.: *See*—
Nath, Prem; and Gattuso, David A., 4,462,332, Cl. 118-718.000.
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,462,333, Cl. 118-723.000.

Engelhard Corporation: *See*—
Adlhart, Otto J., 4,463,063, Cl. 429-19.000.
Adlhart, Otto J.; and Feigenbaum, Haim, 4,463,066, Cl. 429-34.000.
Amundsen, Alan R.; and Stern, Eric W., 4,462,998, Cl. 424-245.000.
Cohn, J. Gunther; Feigenbaum, Haim; and Kaufman, Arthur, 4,463,068, Cl. 429-34.000.
Feigenbaum, Haim, 4,463,067, Cl. 429-34.000.

Engelhardt, Friedrich; Hintermeier, Karl; Smerz, Otto; and Wagener, Hans, to Casella Aktiengesellschaft. Water-dispersible polyester, its preparation, and its use as a hydrophiling agent. 4,463,165, Cl. 528-301.000.

Engelmann, Robert J. Security timer for automatic garage door opener. 4,463,292, Cl. 318-283.000.

Engles, John D. Bullet sizing attachment for arbor-type press. 4,462,298, Cl. 86-19.000.

Englund, Rolf A.: *See*—
Schibbye, (Lars) Lauritz B.; and Englund, Rolf A., 4,462,769, Cl. 418-1.000.

Enoki, Masaharu: *See*—
Takano, Masayuki; Sakai, Masaaki; and Enoki, Masaharu, 4,463,391, Cl. 360-14.200.

Ens Bio Logicals, Inc.: *See*—
Smith, Kendall O., 4,462,986, Cl. 424-85.000.

Ensco, Inc.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,462,318, Cl. 110-238.000.

Entenmann, Robert: *See*—
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,462,362, Cl. 123-425.000.

EPE Corporation: *See*—
Davis, Wesley O., Jr.; and Gallo, Ernest, 4,462,532, Cl. 228-40.000.

Erasov, Fedor N.; Levitsky, Viktor K.; and Skripkin, Sergei V. Planetary hydraulic motor. 4,462,773, Cl. 418-61.00B.

Erdei, Janos: *See*—
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.

Erdelsky, Joseph J.: *See*—
Genbauffe, Francis S.; Erdelsky, Joseph J.; and Shopsky, Harvey J., 4,462,424, Cl. 137-613.000.

Erhard, Herman H., to United States of America, Air Force. Portable slotting device. 4,462,286, Cl. 82-1.400.

Ericson, Richard J., to Otis Elevator Company. Elevator cab. 4,462,193, Cl. 52-282.000.

Ernster, Peter J.; and Jacyno, Henry, to Sunbeam Corporation. Agitator assembly for use in blender appliance. 4,462,694, Cl. 366-205.000.

Erwin Sick GmbH Optik-Elektronik: *See*—
Krause, Gerhard, 4,462,687, Cl. 356-326.000.

Esakov, Daniel A.: *See*—
Brunelle, Dennis S.; and Esakov, Daniel A., 4,462,155, Cl. 29-857.000.

Esso Resources Canada Limited: *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.

Ethyl Corporation: *See*—
Everly, Charles R.; and Roper, Jerry M., 4,463,186, Cl. 560-82.000.
Everly, Charles R.; and Roper, Jerry M., 4,463,187, Cl. 560-82.000.

Ethyl Molded Products Company: *See*—
Luenser, Werner R.; and Ostrowsky, Efrem M., 4,462,502, Cl. 215-329.000.

Eufemia, Joseph C. Pizza cone with filling. 4,463,021, Cl. 426-90.000.

Evans, Edwin R.; and Razzano, John S., to General Electric Company. Oil extended silicone elastomer composition. 4,463,118, Cl. 524-264.000.

Evans, Walter R., to Sargent & Greenleaf, Inc. Changeable safe deposit lock with slidable clamped fences. 4,462,230, Cl. 70-383.000.

Everett, William F., to South Bend Controls, Inc. Adjustable, rectilinear motion proportional solenoid. 4,463,332, Cl. 335-258.000.

Everly, Charles R.; and Roper, Jerry M., to Ethyl Corporation. Process for the preparation of 3,5-dihydrocarbyl-4-hydroxybenzylmalonic acid esters. 4,463,186, Cl. 560-82.000.

Everly, Charles R.; and Roper, Jerry M., to Ethyl Corporation. Process for the preparation of 3,5-dihydrocarbyl-4-hydroxybenzylmalonic acid esters. 4,463,187, Cl. 560-82.000.

Evreka, Inc.: *See*—
Cerami, Anthony, 4,462,989, Cl. 424-177.000.

Ex-Cell-O Corporation: *See*—
Drushel, Robert W., 4,463,240, Cl. 219-69.00G.
Rangwala, Badruddin K., 4,462,436, Cl. 141-250.000.

Expandable Van Tops Ltd.: *See*—
Lange, Jack, 4,462,631, Cl. 296-160.000.

Exxon Research & Engineering Co.: *See*—
Biceroglu, Omer; and Sankey, Bruce M., 4,462,895, Cl. 208-59.000.
Jessup, Peter J.; and Feldman, Nicholas, 4,462,810, Cl. 44-68.000.
Johnson, Jack W.; and Jacobson, Allan J., 4,463,175, Cl. 544-225.000.
Liu, Huei-Cheng, 4,463,204, Cl. 585-437.000.
Lundberg, Robert D., 4,463,168, Cl. 528-355.000.
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, 4,463,151, Cl. 526-307.500.
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, 4,463,152, Cl. 526-307.500.

Ezell, William H.: *See*—
Hemond, Harold C.; and Ezell, William H., 4,463,454, Cl. 367-173.000.

Ezzell, Bobby R., to Dow Chemical Company, The. Composite ion exchange membranes. 4,462,877, Cl. 204-98.000.

F. S. Brainard & Company: *See*—
Bash, Ignatius F., 4,462,263, Cl. 73-861.770.

Fairchild Camera & Instrument Corp.: *See*—
Gordon, James S., 4,463,270, Cl. 307-296.00R.

Fajt, John; and Neal, James V., Jr., to Xenell Corporation. Apparatus and methods for handling electrical components. 4,462,518, Cl. 198-479.000.

Falcimaigne, Jean, to Institut Francais du Petrole. Riser for great water depths. 4,462,717, Cl. 405-195.000.

Falconieri, Remo, to Ing. C. Olivetti & C., S.p.A. Printing and/or correcting device for printing machines. 4,462,707, Cl. 400-225.000.

Fallon, Peter: *See*—
Steinberg, Meyer; and Fallon, Peter, 4,463,210, Cl. 585-469.000.

Farag, Samir F.: *See*—
Kleinecke, John D.; Little, Thomas R.; and Farag, Samir F., 4,463,408, Cl. 361-342.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Melloni, Piero; Salvadori, Paolo; and Lovisolo, Pier P., 4,463,001, Cl. 424-246.000.

Farrand Industries, Inc.: *See*—
Ruhle, Frank S., 4,463,333, Cl. 336-115.000.

Farrar, D. Frank, Jr.: *See*—
Smith, Hoyt L.; and Farrar, D. Frank, Jr., 4,462,582, Cl. 270-31.000.
Smith, Hoyt L.; and Farrar, D. Frank, Jr., 4,462,583, Cl. 270-31.000.
Smith, Hoyt L.; and Farrar, D. Frank, Jr., 4,462,584, Cl. 270-31.000.

Fasano, Michael, to Porta Systems Corp. Plug type gas tube replacement module. 4,463,403, Cl. 361-124.000.

Federal Signal Corporation: *See*—
Eggers, Fredrick W., 4,463,282, Cl. 315-70.000.

Fegan, Richard M.: *See*—
Berfield, Robert C.; and Fegan, Richard M., 4,462,137, Cl. 15-353.000.

Fehlmann, Hans B. Battery-molding method and molding apparatus. 4,462,949, Cl. 264-261.000.

Fehr, Werner, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG. Process and apparatus for the control of a volume of fluid moving through a duct system. 4,462,217, Cl. 62-133.000.

Feigenbaum, Haim, to Engelhard Corporation. Fuel cell and system for supplying electrolyte thereto utilizing cascade feed. 4,463,067, Cl. 429-34.000.

Feigenbaum, Haim: *See*—
Adlhart, Otto J.; and Feigenbaum, Haim, 4,463,066, Cl. 429-34.000.
Cohn, J. Gunther; Feigenbaum, Haim; and Kaufman, Arthur, 4,463,068, Cl. 429-34.000.

Feil, Joseph N.; and Albert, Anthony P., to Goodyear Tire & Rubber Company, The. Process for the manufacture of polyester film. 4,462,953, Cl. 264-564.000.

Feil, Joseph N.: *See*—
Gartland, Robert J.; and Feil, Joseph N., 4,463,121, Cl. 524-291.000.

Felco, Inc.: *See*—
Caplis, Thomas J.; Peck, Carrol E.; and Felton, John C., 4,462,747, Cl. 414-567.000.

Feldman, Nicholas: *See*—
Jessup, Peter J.; and Feldman, Nicholas, 4,462,810, Cl. 44-68.000.

Feller, Murray F., to Wilgood Corporation. Acoustic flow sensors. 4,462,264, Cl. 73-861.180.

Felton, John C.: *See*—
Caplis, Thomas J.; Peck, Carrol E.; and Felton, John C., 4,462,747, Cl. 414-567.000.

Ferguson, John H.; Norland, Kenneth S.; and Sofen, Stephen R., to Polaroid Corporation. Silver diffusion transfer film unit with noble metal compound as stabilizer. 4,463,082, Cl. 430-228.000.

Ferman, Randal S.: *See*—
Smith, Wallace L.; and Ferman, Randal S., 4,462,751, Cl. 415-89.000.

Fernandes, Peter M.: *See*—
Hanisch, Wolfgang H.; and Fernandes, Peter M., 4,462,940, Cl. 260-112.00R.

Figgie International Inc.: *See*—
Mitchell, Mark E., 4,462,590, Cl. 273-65.00E.

Filtration Water Filters for Agriculture & Industry Ltd.: *See*—
Barzuza, Yzhak, 4,462,622, Cl. 285-323.000.

Fiorentino, Robert J.; and Smith, E. Garland, Jr., to Battelle Development Corporation. Rapid extrusion of hot-short-sensitive alloys. 4,462,234, Cl. 72-41.000.

Firestone Tire & Rubber Company, The: *See*—
Kibler, Richard W., 4,463,155, Cl. 528-61.000.

Fischer, Erwin: *See*—
Henych, Ivo; and Fischer, Erwin, 4,462,455, Cl. 164-340.000.

Fischer, Herbert, to SIG - Schweizerische Industrie-Gesellschaft. Apparatus for transferring groups of disc-shaped objects. 4,462,515, Cl. 198-426.000.

Fisher, Charles B.; and Fisher, Sidney T. Recording system with noise reduction. 4,463,392, Cl. 360-30.000.

Fisher, Michael D., to American Standard, Inc. Seal assembly. 4,462,192, Cl. 52-240.000.

Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,463,392, Cl. 360-30.000.

Finsler GmbH: *See*—
Bohl, Rainer; and Hiller, Dorothee, 4,462,388, Cl. 126-390.000.

Flanders, James R., to USM Corporation. Shoe upper conforming machine. 4,462,132, Cl. 12-85.000.

Flanders, Thomas W.: *See*—
Cooper, Steven R.; Flanders, Thomas W.; and Hughes, David M., 4,463,231, Cl. 200-153.00J.

Fleck, George J., to Whirlpool Corporation. Insulated cabinet construction for chest freezers. 4,462,646, Cl. 312-214.000.

Flederbach, Mark; and Gallusser, David O., to Bendix Corporation, The. Electrical connector assembly. 4,462,653, Cl. 339-89.00R.

Fleissner, Heinz, to Vepa AG. Apparatus for supporting a roll looped around by a textile material. 4,462,226, Cl. 68-5.00D.

Fletcher, Robert P., to International Business Machines Corporation. Multiprocessor cache replacement under task control. 4,463,420, Cl. 364-200.000.

Flores, David P.; and Allen, James A., to Dow Chemical Company, The. Method for reducing block of ethylene interpolymers containing —COOH groups. 4,463,122, Cl. 524-322.000.

Flores, David P.; and Allen, James A., to Dow Chemical Company, The. Method for reducing block of ethylene interpolymers containing —COOH groups. 4,463,123, Cl. 524-322.000.

Flores, David P.; and Allen, James A., to Dow Chemical Company, The. Method for reducing block of ethylene interpolymers containing —COOH groups. 4,463,124, Cl. 524-394.000.

Fluck, Rene , to SIG - Schweizerische Industrie-Gesellschaft. Vibratory conveyor. 4,462,522, Cl. 198-766.000.

FMC Corporation: *See*—
Crea, David A.; and Keely, Jerry A., 4,462,973, Cl. 423-322.000.
McGinley, Emanuel J.; and Tuason, Domingo C., Jr., 4,462,839, Cl. 106-198.000.

Foerster, Rolf F., to Northern Petrochemical Company. Polyolefin polymerization catalyst containing sterically unhindered phenolic compounds (II). 4,463,102, Cl. 502-127.000.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Apparatus for providing a reliable electrical connection. 4,462,648, Cl. 339-3.00S.

Fong, Dodd W.: *See*—
Gross, Anthony E.; Branning, Merle L.; and Fong, Dodd W., 4,462,808, Cl. 44-51.000.

Fontaine, Paul I.; Jones, Evan T. R.; and Batham, John K., to Foseco International Limited. Treatment agents for molten steel. 4,462,823, Cl. 75-58.000.

Forbes, Ronald L.; and Winkler, Richard G., to Honeywell Inc. Fault tolerant, self-powered data reporting system. 4,463,352, Cl. 340-825.050.

Ford, Michael E.: *See*—
Johnson, Thomas A.; and Ford, Michael E., 4,463,193, Cl. 564-479.000.

Ford Motor Company: *See*—
Asik, Joseph R., 4,462,380, Cl. 123-620.000.
Bambenek, Charles L.; and Lewitzke, Craig W., 4,462,620, Cl. 285-162.000.
Gebhard, Harold C., 4,462,303, Cl. 98-2.000.
Giardini, Dante S., 4,462,348, Cl. 123-179.00R.
Holubka, Joseph W., 4,463,143, Cl. 525-528.000.
Wiltshire, Antony R., 4,462,285, Cl. 81-468.000.
Wineland, Richard J.; and Gault, Robert L., 4,463,305, Cl. 322-10.000.

Forsell, Kenneth A.: *See*—
Snowdon, Albert C.; Forsell, Kenneth A.; Theisen, Peter J.; Zarling, Emil W.; and Porter, David G., 4,462,657, Cl. 339-256.00S.

Fortuna, Vincent: *See*—
MacLaughlin, Donald; and Fortuna, Vincent, 4,462,849, Cl. 156-73.500.

Foseco International Limited: *See*—
Fontaine, Paul I.; Jones, Evan T. R.; and Batham, John K., 4,462,823, Cl. 75-58.000.

Foster, Bryan D., to Norton Company. Kiln car furniture module(s). 4,462,798, Cl. 432-258.000.

Foster, Kenneth L.: *See*—
Snyder, Kenneth L., Jr.; and Foster, Kenneth L., 4,462,920, Cl. 252-75.000.

Fox, Albert D., to D. W. Zimmerman Mfg., Inc. Fluid-operated, load-handling apparatus. 4,462,571, Cl. 254-270.000.

Fradkin, Judith N.: *See*—
Pfeffer, Henry A., III; and Fradkin, Judith N., 4,462,794, Cl. 432-14.000.

Framatome: *See*—
Albin, Michel; and Pillon, Dominique B., 4,462,955, Cl. 376-272.000.
Boiron, Pierre; and Poitrenaud, Pierre, 4,462,956, Cl. 376-287.000.

Franchi, Roberto D. Child proof medicine vial. 4,462,501, Cl. 215-296.000.

Frankel, David G.; and Barrett, Michael J., to United States of America, Air Force. Data buffer apparatus between subsystems which operate at differing or varying data rates. 4,463,443, Cl. 364-900.000.

Franklin Electric Co., Inc.: *See*—
Miller, Thomas A., 4,463,304, Cl. 318-790.000.
Speed, Russell H., 4,462,758, Cl. 417-38.000.

Franklin, Paul R., Jr. CO_2 Snow forming header. 4,462,423, Cl. 137-561.00A.

Franko, Lloyd; and Lapchynski, Lenard. Lock boxes. 4,462,317, Cl. 109-45.000.

Franks, Terry E.: *See*—
Boozer, James M.; Franks, Terry E.; and Rothweiler, Richard C., 4,463,398, Cl. 361-1.000.

Frantz, Jack W.: *See*—
Adkins, Joey B.; and Frantz, Jack W., 4,463,340, Cl. 340-64.000.

Frazier, James G. Nutcracking machine. 4,462,309, Cl. 99-575.000.

Frech, Kenneth J.: *See*—
Tazuma, James J.; and Frech, Kenneth J., 4,462,968, Cl. 423-224.000.

Freckman, William G.; Jakubowski, Zbigniew L.; Bunge, Richard H.; French, James C.; and Balta, Lucia E., to Warner-Lambert Company. Antibiotic roridin E-2. 4,463,182, Cl. 549-264.000.

Fredrickson, Lee R.: *See*—
Schultz, Elmer L.; and Fredrickson, Lee R., 4,463,355, Cl. 340-971.000.

Freeman, Sandra D. Display structure formed of a unitary blank. 4,462,178, Cl. 40-539.000.

Freeman, Willie B.; and Span, Richard M., to Westinghouse Electric Corp. Pneumatic operating mechanism for a circuit breaker. 4,463,229, Cl. 200-82.00B.

Freiberg, Peter C., to P.C. Freiberg Pty. Ltd. Means for interconnecting panels. 4,462,196, Cl. 52-586.000.

Freimiller, Gary L.: *See*—
Tyrell, John A.; Liu, Ping Y.; and Freimiller, Gary L., 4,463,132, Cl. 525-92.000.

Freimuth, John H.: *See*—
Schlotterbeck, Stephen C.; Uhland, Francis L., Jr.; Campbell, Willis R.; and Freimuth, John H., 4,462,203, Cl. 56-341.000.

Freitag, Dieter: *See*—
Serini, Volker; Peters, Horst; Rudolph, Udo; Buekers, Josef; Nouvertne; and Freitag, Dieter, 4,463,130, Cl. 525-67.000.

French, Bruce C. Pressure compensated flow control system. 4,462,566, Cl. 251-30.000.

French, James C.: *See*—
Freckman, William G.; Jakubowski, Zbigniew L.; Bunge, Richard H.; French, James C.; and Balta, Lucia E., 4,463,182, Cl. 549-264.000.
French, Roy E. Animal trap. 4,462,182, Cl. 43-85.000.
Frenkel C-D Aktiengesellschaft: *See*—
Meyer, Paul, 4,462,692, Cl. 366-89.000.
Freyer, Karl: *See*—
Schwarz, Theodor; Freyer, Karl; and Theilmann, Manfred, 4,462,404, Cl. 128-321.000.
Frick, Ralph E.; and McNulty, Nelson E., to Frick, Ralph E. State/interval redundant controller system for traffic signals. 4,463,339, Cl. 340-906.000.
Friedman, Bernard, to Oil Process Systems, Inc. Method and system for filtering cooking oil. 4,462,915, Cl. 210-765.000.
Friedrich, Ludwig: *See*—
Schlecker, Rainer; Friedrich, Ludwig; and Lenke, Dieter, 4,463,007, Cl. 424-251.000.
Friesen, Robert J.: *See*—
Okkerse, Simon W. J. H.; Friesen, Robert J.; and Robar, James D. J., 4,463,345, Cl. 340-505.000.
Fritsch, Kenneth L.; Jordan, William A.; and Lopez, Hugo A., to Zenith Electronics Corporation. Process for forming conductive bridge in cathode ray tubes. 4,463,075, Cl. 430-23.000.
Fritz, William O.; Chamberlain, John C.; and Chandler, Gary C., to Trilog, Inc. Dot matrix line printer. 4,462,702, Cl. 400-58.000.
Froment, Jean-Louis: *See*—
Dazzi, Jean-Louis; and Froment, Jean-Louis, 4,462,369, Cl. 123-450.000.
Frommer, Jane E.: *See*—
Shacklette, Lawrence W.; Miller, Granville G.; and Frommer, Jane E., 4,462,929, Cl. 252-518.000.
Frommeyer, Heinrich: *See*—
Brinkmeier, Friedhelm; and Frommeyer, Heinrich, 4,462,779, Cl. 425-140.000.
Frucht, Isaac: *See*—
Rovinsky, William Z.; and Frucht, Isaac, 4,462,731, Cl. 411-433.000.
Fuji Electric Company, Ltd.: *See*—
Kazama, Toyoki; and Shimatani, Michiro, 4,462,862, Cl. 156-643.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Takano, Toshio, 4,462,276, Cl. 74-866.000.
Fuji Kagakushi Kogyo Co., Ltd.: *See*—
Tokunaga, Yukio; Ikeda, Yasuhisa; Seto, Tadao; and Shimazaki, Yoshikazu, 4,463,034, Cl. 427-256.000.
Fuji Photo Film Co., Ltd.: *See*—
Fujiwara, Hirotomo; and Hara, Yoshio, 4,463,042, Cl. 428-35.000.
Kitajima, Masao; Seshimoto, Osamu; Namiki, Tomizo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Mizobuchi, Yuzo, 4,463,083, Cl. 430-273.000.
Kogane, Mikio, 4,462,588, Cl. 271-265.000.
Mitsui, Akio; and Morigaki, Masakazu, 4,463,085, Cl. 430-372.000.
Naito, Hideki; Hara, Hiroshi; and Sato, Kozo, 4,463,079, Cl. 430-203.000.
Fuji Xerox Co., Ltd.: *See*—
Kikuchi, Yoshiki; Ohmori, Takashi; and Moriguchi, Haruhiko, 4,463,360, Cl. 346-76.0PH.
Kurata, Masami; and Inui, Toshiharu, 4,462,704, Cl. 400-120.000.
Moriguchi, Fujio; Murayama, Tomio; and Ohmori, Takashi, 4,463,301, Cl. 318-696.000.
Fujii, Akira; and Beppu, Norio, to Minolta Camera Kabushiki Kaisha. Control device for periodic flash photographing. 4,462,667, Cl. 354-137.000.
Fujii, Hiroshi; and Kamegaya, Sigeru, to Nissan Motor Company, Limited. Split type internal combustion engine. 4,462,351, Cl. 123-198.00F.
Fujii, Masahiko: *See*—
Mizuno, Mitsuo; Suginaka, Akinori; Fujii, Masahiko; and Akimoto, Shinichi, 4,462,984, Cl. 424-78.000.
Fujikawa, Kenji; and Hirose, Ryusho, to Canon Kabushiki Kaisha. Television camera. 4,463,384, Cl. 358-227.000.
Fujimaki, Tatsuo: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; Fujimaki, Tatsuo; Yamaguchi, Shinsuke; and Tomita, Seisuke, 4,463,133, Cl. 525-99.000.
Fujimoto, Mitsaru; Imai, Hisashi; and Matumoto, Takashi, to Sumitomo Rubber Industries, Ltd. Tire withdrawal arrangement. 4,462,776, Cl. 425-31.000.
Fujirebio Kabushiki Kaisha: *See*—
Harada, Takahiro; Miyagawa, Eiji; Umemoto, Junko; Yoshida, Tsutomu; and Hamakado, Toshinari, 4,463,091, Cl. 435-68.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,462,999, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,463,002, Cl. 424-246.000.
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Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,463,000, Cl. 424-246.000.
Fujitsu Fanuc Ltd.: *See*—
Inaba, Hajimu; and Inagaki, Shigemi, 4,462,748, Cl. 414-738.000.
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Asakawa, Kazuo; and Miyazaki, Toshimasa, 4,463,290, Cl. 318-135.000.
Sugo, Yasuhisa; Toyoda, Kazuhiro; and Yamada, Katuyuki, 4,463,448, Cl. 365-190.000.
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Suzukamo, Gohfu; Fukao, Masami; and Yoneyoshi, Yukio, 4,463,188, Cl. 562-506.000.
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Fukunaga, Takeshi; and Tajima, Kunio, to Bridgestone Tire Company Limited. Process of and apparatus for manufacturing bladders used for tire building machine. 4,462,850, Cl. 156-110.100.
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Mizutani, Tomoji; Fukushima, Hitoshi; and Sakamoto, Yoshihiro, 4,463,153, Cl. 526-348.100.
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Kitagawa, Hiroshi; Onodera, Teruyuki; Fukushima, Toshiyuki; and Hayashi, Yoriyuki, 4,462,896, Cl. 208-253.000.
Fuller, James S., to Portals Limited. Paper incorporating a partially embedded strip. 4,462,867, Cl. 162-103.000.
Fuller, LeRoy C. Self-adjusting window unit with corner assembly. 4,462,186, Cl. 49-463.000.
Fulmer, Frederick J.; and Moschak, George, to Viking Injector Company. Dissolving and dispensing apparatus. 4,462,511, Cl. 222-52.000.
Funada, Takeo, to Diesel Kiki Company, Ltd. Fuel injection system for internal combustion engine. 4,462,368, Cl. 123-446.000.
Furlong, Stanley J. Device for measuring lengths and conforming angles. 4,462,166, Cl. 33-416.000.
Furr, Samuel T.; and Bauer, Robert E., to Bethlehem Steel Corp. Method of reconditioning welded joints. 4,462,533, Cl. 228-119.000.
Furuhashi, Toshio: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Otamu; and Hasegawa, Taiji, 4,462,378, Cl. 123-571.000.
Fushiya, Fusao; and Inoue, Nobuhiro, to Makita Electric Works, Ltd. Power cutting tool. 4,462,381, Cl. 125-4.000.
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Gabriel, Steven A.: *See*—
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Gagnet, Thomas R., to Ingersoll-Rand Company. Hoist overload limiter. 4,462,570, Cl. 254-268.000.
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Gallagher, John N.: *See*—
Warmack, Ralph E.; Marney, O. Guy, Jr.; Gallagher, John N.; and Passmore, Paul R., 4,463,451, Cl. 367-16.000.
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Gallusser, David O.: *See*—
Flederbach, Mark; and Gallusser, David O., 4,462,653, Cl. 339-89.00R.
Gammill, Ronald B., to Upjohn Company, The. 1-(6-Hydroxy-4- or -7-methoxy-5-benzofuranyl)-4-substituted-1,3-butanediones. 4,463,185, Cl. 549-471.000.
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., to Colgate Palmolive Company. High bulk density particulate heavy duty laundry detergent. 4,462,804, Cl. 8-137.000.
Garagiola, Adelmo: *See*—
Perego, Giuseppe; and Garagiola, Adelmo, 4,462,326, Cl. 112-318.000.
Garhammer, Arnold: *See*—
Hechtl, Wolfgang; and Garhammer, Arnold, 4,462,936, Cl. 260-429.700.
Garner, David: *See*—
Volk, Joseph A., Jr.; and Garner, David, 4,463,430, Cl. 364-468.000.
Garner, J. Harlan. Reflective road marker. 4,462,711, Cl. 404-10.000.
Gartland, Robert J.; and Feil, Joseph N., to Goodyear Tire & Rubber Company, The. Thermoforming partially crystalline polyester articles. 4,463,121, Cl. 524-291.000.
Garwood, William E.: *See*—
Dwyer, Francis G.; and Garwood, William E., 4,463,101, Cl. 502-74.000.
Garza, Roberto M. Means for controlling lateral movement of a helicopter. 4,462,559, Cl. 244-17.190.
Gass, Arthur D.: *See*—
Soulliard, Charles; Ward, Herschel W.; Gass, Arthur D.; and Hudor, Andrew M., Jr., 4,463,221, Cl. 179-2.0EB.
Gatrone, Ralph C.: *See*—
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Gattuso, David A.: *See*—
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Gaudreault, Pierre, to Les Equipments Forestiers SLR Inc. Dual head delimber. 4,462,438, Cl. 144-2.00Z.
Gauld, W. Thomas. Apparatus for screening fibrous stock. 4,462,901, Cl. 209-234.000.
Gault, Robert L.: *See*—
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Gavaletz, Eugene J.: *See*—
Usher, Peter P.; and Gavaletz, Eugene J., 4,462,603, Cl. 277-230.000.

Gebhard, Harold C., to Ford Motor Company. Multifunction sail mirror. 4,462,303, Cl. 98-2.000.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Hotger, Karl, 4,462,619, Cl. 285-94.000.
Geelhood, Bruce D.: *See*—
Young, Charles A.; Geelhood, Bruce D.; and Silva, Dennis M., 4,463,264, Cl. 250-390.000.
Geipel, Henry J., Jr.; Troutman, Ronald R.; and Wursthorn, John M., to International Business Machines Corporation. Method of making high density complementary transistors. 4,462,151, Cl. 29-576.00B.
Gemmill, Robert M., Jr.: *See*—
Schick, John W.; and Gemmill, Robert M., Jr., 4,463,201, Cl. 585-10.000.
Genbauffe, Francis S.; Erdelsky, Joseph J.; and Shopsky, Harvey J., to Robertshaw Controls Company. Propellant storage construction, parts therefor and methods of making the parts. 4,462,424, Cl. 137-613.000.
Gendron, Wilfred H., to Westvaco Corporation. Door hanger envelope. 4,462,538, Cl. 229-68.00R.
General Dynamics, Pomona Division: *See*—
Ross, Oakley G.; and Wedertz, Larry D., 4,462,421, Cl. 137-542.000.
General Electric Company: *See*—
Bools, William G., 4,463,267, Cl. 290-40.00R.
Evans, Edwin R.; and Razzano, John S., 4,463,118, Cl. 524-264.000.
Giles, Walter B.; and Lipstein, Norman J., 4,462,205, Cl. 60-39.020.
Hale, Thomas E., 4,463,062, Cl. 428-698.000.
Hammer, Edward E.; and Beck, Charles E., 4,463,280, Cl. 313-594.000.
Hull, Peter R., 4,462,204, Cl. 60-39.070.
Kim, Bang M.; and Amodeo, Paul A., Jr., 4,462,913, Cl. 210-708.000.
Kosmatka, Walter J.; and Zalar, Frank E., 4,463,278, Cl. 313-318.000.
Levinson, Lionel M., 4,463,268, Cl. 307-106.000.
Mark, Victor; and Hedges, Charles V., 4,463,160, Cl. 528-176.000.
Mark, Victor; and Hedges, Charles V., 4,463,161, Cl. 528-176.000.
Miller, Matthew S., 4,463,239, Cl. 219-10.55F.
Otsuki, Masaaki, 4,462,828, Cl. 106-3.000.
Prada, Luis E., 4,462,437, Cl. 141-360.000.
Sidebottom, Donald L., 4,463,348, Cl. 340-585.000.
Smith, Gary W., 4,463,241, Cl. 219-69.00W.
Tyrell, John A.; Liu, Ping Y.; and Freimiller, Gary L., 4,463,132, Cl. 525-92.000.
Young, John A. I., 4,463,289, Cl. 318-52.000.
General Motors Corporation: *See*—
Bly, Kenneth B.; Stark, Terrance L.; and Ludecke, Otto A., 4,462,812, Cl. 55-502.000.
Greenlee, Michael E., 4,463,069, Cl. 429-86.000.
Gregg, Willard W., 4,462,628, Cl. 296-1.00S.
Hicks, Robert H.; Senko, Steve M.; Budenaers, Roland J.; and Teno, Richard L., 4,462,208, Cl. 60-286.000.
Kearney, Mark B., 4,463,319, Cl. 330-258.000.
Lederman, Frederick E., 4,462,608, Cl. 280-668.000.
Lockhart, Bruce D., 4,462,357, Cl. 123-336.000.
Stoltman, Donald D.; and Storey, Edwin C., 4,462,259, Cl. 73-749.000.
Warwick, Edward H.; Parker, Donald L.; and Kaup, Ralph J., 4,462,487, Cl. 192-4.00A.
Genin, Bernard C. D.: *See*—
Ulmer, Georges; and Genin, Bernard C. D., 4,462,615, Cl. 277-235.00B.
Gentric, Alain; and Lahaussois, Michel. Switch with several layers of crossing points. 4,463,235, Cl. 200-175.000.
George Angus & Company Limited: *See*—
Johnston, David E., 4,462,600, Cl. 277-25.000.
George Fischer Ltd.: *See*—
Henych, Ivo; and Fischer, Erwin, 4,462,455, Cl. 164-340.000.
George, James M.; and Smith, James D., to Trinol Chemical Corporation. Method and apparatus for washing drilling cuttings. 4,462,416, Cl. 134-104.000.
Georgia Tech Research Institute: *See*—
Morgan, Kenneth S.; and Brazell, James W., 4,462,605, Cl. 280-242.0WC.
Gerben, Ralph D.: *See*—
Walters, Harry J.; and Gerben, Ralph D., 4,462,738, Cl. 414-127.000.
Gerber Garment Technology, Inc.: *See*—
Pearl, David R., 4,462,292, Cl. 83-471.200.
Gerhart, Grant R.; and Rose, Douglas N., to United States of America, Army. Strain sensitive ultrasonic surface wave detector. 4,462,257, Cl. 73-644.000.
Gerlach Industries: *See*—
Iannelli, Frank M., 4,462,220, Cl. 62-201.000.
Gewerkschaft Eisenhutte Westfalia: *See*—
Rafael, Werner; and Pfefferle, Egon, 4,462,637, Cl. 299-32.000.
Gi, Kim D. Process for the preparation of fuel oil, fuel gas and pyrolysis coke by pyrolysis. 4,463,203, Cl. 585-241.000.
Giannini, Ivo: *See*—
Baroncelli, Vittorio; Colapicchioni, Claudio; Giannini, Ivo; and Porcelli, Filippo, 4,463,099, Cl. 436-546.000.
Giardini, Dante S., to Ford Motor Company. Engine starting system. 4,462,348, Cl. 123-179.00R.
Gibson, Paul N. Windshield wiper control apparatus. 4,463,294, Cl. 318-313.000.
Gieson, Clarence L.; Marsh, Randy J.; and Lunt, Reginald F. J., to Metromail Corporation. Thickness adjustable material detector for gripper mechanism. 4,462,585, Cl. 271-11.000.
Gifford, Paul R.; Shacklette, Lawrence W.; Toth, James E.; and Wolf, James F., to Allied Corporation. Secondary batteries using room-temperature molten non-aqueous electrolytes containing 1,2,3-trialkylimidazolium halides or 1,3-dialkylimidazolium halide. 4,463,071, Cl. 429-194.000.
Gifford, Paul R.; Palmisano, James B.; Shacklette, Lawrence W.; Chance, Ronald R.; and Toth, James E., to Allied Corporation. Secondary batteries containing room-temperature molten 1,2,3-trialkylimidazolium halide non-aqueous electrolyte. 4,463,072, Cl. 429-194.000.
Gilbert, George G.; and Dimit, Richard O., to Timken Company, The. Tapered roller bearing cage with spin resisting characteristics. 4,462,643, Cl. 308-202.000.
Giles, Walter B.; and Lipstein, Norman J., to General Electric Company. Integrated coal-fired gas turbine power plant. 4,462,205, Cl. 60-39.020.
Gill, Harry A., Jr., to Raytheon Company. Transistor switching circuitry having hysteresis. 4,463,271, Cl. 307-350.000.
Gillery, F. Howard; and Criss, Russell C., to PPG Industries, Inc. Low reflectance, low emissivity sputtered film. 4,462,884, Cl. 204-192.00C.
Gilliam, Raymond J., to United States of America, Navy. Aircraft weight and center of gravity cockpit readout system. 4,463,428, Cl. 364-463.000.
Gilmour, Hugh S. A.; and Blazey, Richard N., to Eastman Kodak Company. Elements containing ordered wall arrays. 4,463,074, Cl. 430-7.000.
Gilpin, Martin L., to Beecham Group p.l.c. 1-Aza-[3.2.0]-bicycloheptane-2-carboxylic acid, ester or salt thereof. 4,463,010, Cl. 424-270.000.
Gilson, John D., to Carrier Corporation. Air conditioning economizer control method and apparatus. 4,462,539, Cl. 236-13.000.
Giuliani, David: *See*—
Silverstein, Fred E.; and Giuliani, David, 4,462,408, Cl. 128-660.000.
GK Technologies, Incorporated: *See*—
Morgenthaler, Allen C., 4,462,242, Cl. 72-467.000.
Glicken, Irving: *See*—
Castellanos, Juan D.; Cardenas, Enrique C.; Kelly, Max B.; Kelly, Lorenzo J.; and Glicken, Irving, 4,462,879, Cl. 204-140.000.
Gloth, Richard E.; Tazuma, James J.; and Smith, Robert A., to Goodyear Tire & Rubber Company, The. Polymeric compounds prepared from diphenylamine and dihydroxyalkylbenzene. 4,463,170, Cl. 528-422.000.
Gnehm, Rene : *See*—
Marti, Hans-Rudolf; and Gnehm, Rene , 4,463,195, Cl. 568-424.000.
Goans, Kip B., to Baker CAC, Inc. Bourdon tube actuator. 4,462,301, Cl. 92-48.000.
Goddard, Robert D.; Schomburg, Robert R.; and Wohler, Wayne L., to International Business Machines Corporation. Facsimile data reduction. 4,463,386, Cl. 358-261.000.
Goergen, Rene , to Goodyear Tire & Rubber Company, The. Pneumatic tire tread. 4,462,445, Cl. 152-209.00R.
Goergen, Rene; and Kleywegt, Jacob, to Goodyear Tire & Rubber Company, The. Pneumatic tire tread. 4,462,446, Cl. 152-209.00R.
Goetze AG: *See*—
Brauers, Bert; Kierst, Reiner; and Morsbach, Martin, 4,462,602, Cl. 277-139.000.
Goguen, Louis J.; and Woodley, George M., to King Instrument Corporation. Splicer tape feed means. 4,462,858, Cl. 156-506.000.
Golan, Leonard W.: *See*—
Rogak, Michael; Witbeck, Charles; Golan, Leonard W.; and Golan, Stephen L., 4,462,179, Cl. 42-1.00Q.
Golan, Stephen L.: *See*—
Rogak, Michael; Witbeck, Charles; Golan, Leonard W.; and Golan, Stephen L., 4,462,179, Cl. 42-1.00Q.
Gold, Nathan. Spectrally tailored wafer chuck shaped light meter. 4,462,688, Cl. 356-328.000.
Goldfarb, Eli M.: *See*—
Advani, Gulu N.; Amundson, Scott A.; and Goldfarb, Eli M., 4,462,246, Cl. 73-23.000.
Golding, Scott M., to Discovision Associates. System for recording and playing back continuous-play and stop-motion signals. 4,463,389, Cl. 358-343.000.
Goldsworthy Engineering, Inc.: *See*—
Goldsworthy, William B., 4,462,946, Cl. 264-23.000.
Goldsworthy, William B., to Goldsworthy Engineering, Inc. Apparatus and method for producing reinforced plastic composite articles of non-uniform shape and non-uniform volume. 4,462,946, Cl. 264-23.000.
Gonzalez, Eduardo B. Drill bit for forming a fluid cushion between the side of the drill bit and the side wall of a bore hole. 4,463,220, Cl. 175-343.000.
Goodfellow, Glenn B., to UTI Corporation. Method for controlling properties of metals and alloys. 4,462,238, Cl. 72-358.000.
Goodyear Tire & Rubber Company, The: *See*—
Becher, Joel P., 4,462,253, Cl. 73-487.000.
Donbar, Ken W.; Barbour, John J.; Henderson, James N.; and Bell, Anthony J., 4,463,146, Cl. 526-142.000.
D'Sidocky, Richard M.; and Parker, Dane K., 4,463,191, Cl. 564-398.000.
Feil, Joseph N.; and Albert, Anthony P., 4,462,953, Cl. 264-564.000.
Gartland, Robert J.; and Feil, Joseph N., 4,463,121, Cl. 524-291.000.

Gloth, Richard E.; Tazuma, James J.; and Smith, Robert A., 4,463,170, Cl. 528-422.000.
Goergen, Rene , 4,462,445, Cl. 152-209.00R.
Goergen, Rene; and Kleywegt, Jacob, 4,462,446, Cl. 152-209.00R.
Maly, Neil A., 4,463,135, Cl. 525-123.000.
Nowak, Edward N.; Hollingshead, William S.; and Muse, Joel, Jr., 4,463,198, Cl. 568-768.000.
Robinson, Allan J.; and Smith, William T., 4,462,450, Cl. 157-1.000.
Siefert, George J.; Kolowski, Michael A.; Lynch, John E.; Ruip, Terrence M.; and Gresens, Henry L., 4,462,447, Cl. 152-353.00C.
Stuchal, Frank W., 4,463,125, Cl. 524-566.000.
Tazuma, James J.; and Frech, Kenneth J., 4,462,968, Cl. 423-224.000.
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Gordon, Eric M.: *See*—
Petrillo, Edward W., Jr.; Gordon, Eric M.; Krapcho, John; and Sprague, Peter W., 4,462,943, Cl. 260-112.50R.

Gordon, Frank E.: *See*—
Campbell, Leslie T.; Gordon, Frank E.; and Torkelson, Herman, 4,462,330, Cl. 114-244.000.

Gordon, George N. Coin feeding device for slot machines. 4,462,414, Cl. 133-5.00B.

Gordon, James S., to Fairchild Camera & Instrument Corp. MOS Comparator circuit. 4,463,270, Cl. 307-296.00R.

Gorham, Robert S., Jr. Triple pass heat exchanger. 4,462,463, Cl. 165-140.000.

Gorre, Luisa E.: *See*—
Pastor, Ricardo C.; Pastor, Antonio C.; Gorre, Luisa E.; and Chew, Remedios K., 4,462,970, Cl. 423-263.000.
Pastor, Ricardo C.; Pastor, Antonio C.; Gorre, Luisa E.; and Chew, Remedios K., 4,462,974, Cl. 423-335.000.

Goto, Jiro: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,463,000, Cl. 424-246.000.

Gould Advance Limited: *See*—
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Gould, Richard J.; and Seiter, George M., to Champion International Corporation. Apparatus for testing abrasion resistance of printed surfaces. 4,462,245, Cl. 73-7.000.

Gowers, Ronald B. Tool extension. 4,462,284, Cl. 81-428.00R.

Grade, Reinhardt; and Lorenz, Joachim, to Ciba-Geigy Corporation. Method of controlling harmful organisms using mono- and dibromodicyanomethane and compositions containing these compounds for the control of such organisms. 4,462,820, Cl. 71-67.000.

Graef, Harry T.; and Wise, Mark J., to Diebold Incorporated. Method of and system for detecting bill status in a paper money dispensing. 4,462,587, Cl. 271-263.000.

Graf, Martin, to Grob & Co. Aktiengesellschaft. Mechanical warp stop motion apparatus. 4,462,433, Cl. 139-358.000.

Grafius, Gerald R., to Swanson Systems, Inc. Apparatus for aligning and feeding elongated objects. 4,462,508, Cl. 221-201.000.

Graham Magnetics Incorporated: *See*—
Deffeyes, Robert J.; and Armstrong, Harris W., 4,463,030, Cl. 427-216.000.

Graham, Noah F.: *See*—
Jackson, O. L.; and Graham, Noah F., 4,462,310, Cl. 100-219.000.

Graham, Woodrow W., Jr., to Sonoco Products Company. Tube with reinforcing strip. 4,462,556, Cl. 242-118.310.

Grandzol, Richard J.; McFaull, Albert J.; Wanger, W. Hunter; and Rabinovic, I. Samuel, to Rohm and Haas Company. Bulk flowable impact modifiers. 4,463,131, Cl. 525-76.000.

Grant, Craig A. Safety door stopper. 4,462,623, Cl. 292-175.000.

Grant, Hendrie J. Thermal management system and apparatus. 4,462,461, Cl. 165-26.000.

Gras, Rainer: *See*—
Disteldorf, Josef; Gras, Rainer; Schnurbusch, Horst; Hubel, Werner; and Wolf, Elmar, 4,463,154, Cl. 528-45.000.

Grassl, Carl J., Sr. Frame for interpretation of classic automotive vehicle and method of fabricating vehicle. 4,462,632, Cl. 296-187.000.

Grattan, David A.: *See*—
Diep, Daniel V.; and Grattan, David A., 4,462,830, Cl. 106-14.140.

Great Lakes Carbon Corporation: *See*—
Landon, Thomas E.; Secrist, Duane R.; and Clark, James M., 4,462,889, Cl. 204-292.000.

Green, David; Stancliffe, Alan D.; Ramsbottom, Lawrence W.; and Thomas, David A., to TBA Industrial Products Limited. Asbestos free jointing. 4,463,109, Cl. 523-333.000.

Green, Howard H.: *See*—
Potash, Hanan; and Green, Howard H., 4,463,423, Cl. 364-300.000.

Green, John C.; and Wheeler, Ronald E. Bulk tobacco racking device. 4,462,734, Cl. 414-26.000.

Green, Sidney J., to Terra Tek, Inc. High pressure rotary coupling. 4,462,617, Cl. 285-14.000.

Greene, George H., to Union Carbide Corporation. Process for imparting lubricity to fiberfill fiber. 4,463,035, Cl. 427-389.900.

Greenlee, Michael E., to General Motors Corporation. Battery venting system. 4,463,069, Cl. 429-86.000.

Gregg, Willard W., to General Motors Corporation. Guide for collapsible drag reducer. 4,462,628, Cl. 296-1.00S.

Grenier, Aime J.; and Bowen, Robert J., to Texas Instruments Incorporated. Interface circuit apparatus. 4,463,401, Cl. 361-72.000.

Grenier, Didier J. R., to U.S. Philips Corporation. Semiconductor device for use in memory cells. 4,463,370, Cl. 357-50.000.

Gresens, Henry L.: *See*—
Siefert, George J.; Kolowski, Michael A.; Lynch, John E.; Ruip, Terrence M.; and Gresens, Henry L., 4,462,447, Cl. 152-353.00C.

Grimes, Gary J., to Bell Telephone Laboratories, Incorporated. Circuitry for allocating access to a demand-shared bus. 4,463,445, Cl. 364-900.000.

Grip-Pak, Inc.: *See*—
Cunningham, Ernest R., 4,462,494, Cl. 206-150.000.

Grittman, Gunter: *See*—
Dorsch, Dieter, 4,462,767, Cl. 417-460.000.

Grob & Co. Aktiengesellschaft: *See*—
Graf, Martin, 4,462,433, Cl. 139-358.000.

Grootherder, Hendrik J.: *See*—
Grootherder, Hendrikus; and Grootherder, Hendrik J., 4,462,537, Cl. 229-45.0EC.

Grootherder, Hendrikus; and Grootherder, Hendrik J. Egg container. 4,462,537, Cl. 229-45.0EC.

Gross, Anthony E.; Branning, Merle L.; and Fong, Dodd W., to Nalco Chemical Company. Dispersant for high solids coal-water slurries. 4,462,808, Cl. 44-51.000.

Grosser, Johannes. Prism system for a variable binocular tube. 4,462,659, Cl. 350-173.000.

Grosswiller, Leo J., Jr.: *See*—
Anders, Walter G.; and Grosswiller, Leo J., Jr., 4,462,721, Cl. 406-112.000.

Groupement Europeen de la Cellulose: *See*—
Carles, Jacques; and Lemoyne, Henri, 4,462,864, Cl. 162-56.000.

Gruber, Hermann; and Wellner, Wolfgang, to Bayer Aktiengesellschaft. Coatings prepared from prepolymers and aromatic diamines having at least one alkyl substituent in an ortho position to each amino group. 4,463,126, Cl. 524-589.000.

Grudkowski, Thomas W.: *See*—
Black, James F.; Grudkowski, Thomas W.; and DeMaria, Anthony J., 4,463,336, Cl. 338-4.000.

Grumman Aerospace Corporation: *See*—
Padawer, Gerald M., 4,463,263, Cl. 250-363.00R.

Gruenewald, Peter; and Brockmeyer, Rudolf, to Wegmann & Co. GmbH, Firma. Mechanism that automatically opens the breech block wedge on a semi-automatic weapon. 4,462,299, Cl. 89-24.000.

GTE Automatic Electric Inc.: *See*—
Kiko, Frederick J.; and Barzen, Thomas J., 4,463,307, Cl. 323-356.000.

GTE Products Corporation: *See*—
Miettunen, Robert E.; and Shaner, Kenneth H., 4,462,724, Cl. 407-30.000.
Wolfe, Robert W.; and Cleveland, Joseph J., 4,462,816, Cl. 65-23.000.
Wolfe, Robert W.; and Cleveland, Joseph J., 4,462,817, Cl. 65-36.000.
Wolfe, Robert W.; and Cleveland, Joseph J., 4,462,818, Cl. 65-36.000.

Guenther, Kenneth L.; Zemke, Edward H.; and Warden, Gerald D., to Bell & Howell Company. Three-way needle valve. 4,462,428, Cl. 137-868.000.

Guerret, Patrick G.; Bucher, Bernard P.; Dostert, Philippe L.; Mocquet, Gisele C.; and Nedelec, Alain L., to Delalande S.A. Dioxazabicyclic derivatives. 4,463,004, Cl. 424-248.500.

Guert, Jean-Louis H., to L'Oreal. Manual massage instrument. 4,462,393, Cl. 128-62.00R.

Guerzoni, Alessandro, to G.A.R.BO. s.n.c. di Guerzoni Alessandro e Renato. Container orienting and directing apparatus. 4,462,516, Cl. 198-427.000.

Guess, Joe F.; and Kruer, Thomas R., to Technicare Corporation. Piezoelectric scanning systems for ultrasonic transducers. 4,462,255, Cl. 73-633.000.

Guest, Philip Q., Jr.: *See*—
Caddick, Gary R.; and Guest, Philip Q., Jr., 4,463,426, Cl. 364-424.000.

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Guillemot, Philippe, to Mecilec. Method of and device for incremental analogue-to-digital conversion. 4,463,343, Cl. 340-347.0AD.

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Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.

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Baker, Wilford S.; and Harrison, James J., 4,462,836, Cl. 106-92.000.
Baker, Wilford S.; and Harrison, James J., 4,462,837, Cl. 106-93.000.
Rutter, Jerry L.; and Ahle, James L., 4,462,821, Cl. 71-99.000.

Gulf Research & Development Company: *See*—
Onopchenko, Judith B.; Singerman, Gary M.; and Sebulsky, Raynor T., 4,462,935, Cl. 260-429.700.

Gundlach, Robert W.; and Bergen, Richard F., to Xerox Corporation. Fluid assisted ion projection printing. 4,463,363, Cl. 346-159.000.

Gunther & Co.: *See*—
Marburger, Fritz, 4,462,727, Cl. 408-220.000.

Gunzner, Fred G. Wear-resistant and shock-resistant tools and method of manufacture thereof. 4,462,293, Cl. 83-855.000.

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Shah, Hasmukh R.; and Gupta, Ashok K., 4,463,446, Cl. 364-900.000.

Gutekunst, Stanley K.: *See*—
Sleep, Craig F.; and Gutekunst, Stanley K., 4,462,313, Cl. 104-50.000.

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Habicht, Helmut. Discharge valve for granular materials. 4,462,567, Cl. 251-297.000.
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Hafner, V. Walter: *See*—
Morris, Earl L.; and Hafner, V. Walter, 4,462,123, Cl. 4-286.000.
Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., to Westvaco Corporation. Pulsed regeneration of adsorption column. 4,462,904, Cl. 210-177.000.
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Walter, Heinz-Peter; and Hahn, Horst, 4,462,723, Cl. 407-18.000.
Hahn, Robert E.: *See*—
Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., 4,463,047, Cl. 428-216.000.
Hain, Josef: *See*—
Landgraf, Hermann; and Hain, Josef, 4,462,803, Cl. 433-88.000.
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Halbauer, Klaus, to Messer Griesheim GmbH. Instrument for keeping the distance constant between a tool and a workpiece to be processed. 4,463,298, Cl. 318-662.000.
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Brill, William F., 4,462,978, Cl. 423-584.000.
Hale, Thomas E., to General Electric Company. Oxide bond for aluminum oxide coated cutting tools. 4,463,062, Cl. 428-698.000.
Hales, Paul D. Timing device driving means. 4,463,226, Cl. 200-35.00R.
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McLaughlin, Homer C.; Weaver, Jimmie D., Jr.; and Hall, Bobby E., 4,462,718, Cl. 405-264.000.
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Halliburton Company: *See*—
Conway, Michael W., 4,462,917, Cl. 252-8.55R.
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Harada, Takahiro; Miyagawa, Eiji; Umemoto, Junko; Yoshida, Tsutomu; and Hamakado, Toshinari, 4,463,091, Cl. 435-68.000.
Haman, David F.; and Needham, Dale M., to Outboard Marine Corporation. Dual fuel system for internal combustion engine. 4,462,346, Cl. 123-73.00A.
Hamill, Robert L.; and Kastner, Ralph E., to Eli Lilly and Company. A47934 Antibiotic and process for production thereof. 4,462,942, Cl. 260-112.50R.
Hammer, Edward E.; and Beck, Charles E., to General Electric Company. Shaped discharge lamp with starting aid. 4,463,280, Cl. 313-594.000.
Hanagan, Michael W., to Corbin Pacific Inc. Adjustable motorcycle seat. 4,462,634, Cl. 297-201.000.
Hanaoka, Masanori: *See*—
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Hanisch, Wolfgang H.; and Fernandes, Peter M., to Cetus Corporation. Process for the recovery of human β-interferon-like polypeptides. 4,462,940, Cl. 260-112.00R.
Hanna, Daniel C. Vehicle washing apparatus with elevatable washing elements. 4,462,133, Cl. 15-97.00B.
Hanneken, Robert L. Fence stay. 4,462,572, Cl. 256-52.000.
Hannett, Louis N.: *See*—
de Mello, F. Paul; Hannett, Louis N.; Parkinson, David W.; and Czuba, John S., 4,463,306, Cl. 322-25.000.
Hansen, Borge B.; and Boe, Ove S., to Danfoss A/S. Electrode arrangement for an oil or gas burner. 4,462,790, Cl. 431-264.000.
Hansen, Gary P., to Red Dot Corporation. Constant temperature control for a vehicle compartment heater or heater-air-conditioner. 4,462,541, Cl. 237-2.00A.
Hara, Hiroshi: *See*—
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Hara, Yoshio: *See*—
Fujiwara, Hirotomo; and Hara, Yoshio, 4,463,042, Cl. 428-35.000.
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Harford, Jack R., to RCA. Integrated circuit overload protection device. 4,463,369, Cl. 357-44.000.
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Harris, Curtis C. Cascade amplification enzyme immunoassay. 4,463,090, Cl. 435-7.000.
Harrison, James J.: *See*—
Baker, Wilford S.; and Harrison, James J., 4,462,836, Cl. 106-92.000.
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Harsco Corporation: *See*—
D'Alessio, Michael S.; and Safier, Robert S., 4,462,197, Cl. 52-637.000.
Hart, Frederick H., to Pilkington Brothers P.L.C. Low emissivity coatings on transparent substrates. 4,462,883, Cl. 204-192.00C.
Harthun, Norman E.: *See*—
Vosper, Ralph R.; Spoormaker, Arie W.; Binasik, Chester S.; and Harthun, Norman E., 4,462,795, Cl. 432-29.000.
Haruna, Tohru: *See*—
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Hase, Brigitte: *See*—
Moller, Hinrich; Hase, Brigitte; Konrad, Gunther; Wilk, Hans-Christoph; and Zeidler, Ulrich, 4,463,006, Cl. 424-251.000.
Hasegawa, Hiromi: *See*—
Murakami, Noboru; and Hasegawa, Hiromi, 4,462,278, Cl. 74-868.000.
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Hasegawa, Michio: *See*—
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Hasegawa, Shinichi: *See*—
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Nakamura, Makoto; Chiyoda, Tsutomu; and Hasegawa, Shinichi, 4,463,197, Cl. 568-754.000.
Hasegawa, Taiji: *See*—
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Hasegawa, Yoshihiko: *See*—
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Hasenkamp, Rainer: *See*—
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Hashimoto, Akio: *See*—
Ito, Tadao; and Hashimoto, Akio, 4,462,961, Cl. 420-534.000.
Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 4,462,553, Cl. 242-55.19A.
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Hashimoto, Yasuhiko, to Mitsubishi Denki Kabushiki Kaisha. Windshifting apparatus for an air conditioner. 4,462,304, Cl. 98-40.00V.
Hashimoto, Yoshitaka; Yamamoto, Kaichi; and Shirota, Norihisa, to Sony Corporation. Digital video data recording apparatus. 4,463,387, Cl. 358-310.000.
Haslanger, Martin F.; and Nakane, Masami, to E. R. Squibb & Sons, Inc. Aryl substituted 7-oxabicycloheptane compounds, useful in inhibiting platelet aggregation. 4,463,015, Cl. 424-285.000.
Haslanger, Martin F., to E. R. Squibb & Sons, Inc. Method for preparing a prostacyclin intermediate. 4,463,183, Cl. 549-311.000.
Hassan, Mohamed A., to Siemens Aktiengesellschaft. Surge voltage arrester with shielding bodies enclosing a column of arrester elements. 4,463,404, Cl. 361-128.000.
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Hataya, Fumio: *See*—
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Hattori, Tadashi; Hanaoka, Masanori; Hashiguchi, Yukihide; Ootsuka, Yoshinori; and Yamaguchi, Hiroaki, to Nippon Sokes, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Knock detecting apparatus for internal combustion engines. 4,462,247, Cl. 73-35.000.
Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Control system for operation of fluid torque converter for vehicles. 4,462,490, Cl. 192-0.076.
Haupt, Fritz, to Maag Gear Wheel & Machine Company Limited. Gear pump with rotatable sections. 4,462,770, Cl. 418-39.000.
Hautemont, Jean-Claude H., to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques ERCA. Mold positioning method and apparatus. 4,462,952, Cl. 264-509.000.
Havens, Arthur B.: *See*—
Dickson, Lyle C.; Hall, Chester A., Jr.; and Havens, Arthur B., 4,463,048, Cl. 428-218.000.
Hawk Industries, Inc.: *See*—
Rogak, Michael; Witbeck, Charles; Golan, Leonard W.; and Golan, Stephen L., 4,462,179, Cl. 42-1.00Q.
Hayashi, Mikio; and Mizutani, Seiki, to Seikosha Co., Ltd. Cross hammer dot printer. 4,462,705, Cl. 400-121.000.
Hayashi, Yoriyuki: *See*—
Kitagawa, Hiroshi; Onodera, Teruyuki; Fukushima, Toshiyuki; and Hayashi, Yoriyuki, 4,462,896, Cl. 208-253.000.
Hayden, Richard. Fire lighter. 4,462,791, Cl. 431-345.000.
Haylett, Lyle M.; Houck, Robert J.; and King, Kevin J., to B. F. Goodrich Company, The. Digital phase shift circuit signal generator for rip detectors. 4,463,434, Cl. 364-507.000.
Hays, Byron G.; and Maguire, Philip L., to Inmont Corporation. Process for treating diarylide yellow pigment. 4,462,833, Cl. 106-23.000.
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, to Hitachi, Ltd. Oil feeding device for scroll fluid apparatus. 4,462,772, Cl. 418-55.000.

Healthdyne, Inc.: *See*—
Pace, Max L.; Shipley, Fred J.; and Webb, Jerald H., 4,462,409, Cl. 128-675.000.
Hechtl, Wolfgang; and Garhammer, Arnold, to Wacker-Chemie GmbH. Reaction products of silicic acid esters and organic tin compounds. 4,462,936, Cl. 260-429.700.
Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,463,160, Cl. 528-176.000.
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Hegedus, Louis; Vayenas, Costas G.; and Michaels, James N., to W. R. Grace & Co.; and Massachusetts Institute of Technology. Fuel cell and method for conducting gas-phase oxidation. 4,463,065, Cl. 429-33.000.
Hehl, Karl. Mechanism for exchanging molding dies in an injection molding machine. 4,462,783, Cl. 425-183.000.
Heidemann, Klaus. Conveyor belt repair tool. 4,462,626, Cl. 294-114.000.
Heiskell, Ronald E. Drumstrick for playing percussion instruments. 4,462,296, Cl. 84-422.00S.
Heiss, Adolf. Rust converting and rust inhibiting primer. 4,462,829, Cl. 106-14.050.
Heiss, John F.: *See*—
Chandler, William S.; Wilkens, Walter F.; and Heiss, John F., 4,463,026, Cl. 426-652.000.
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Hellawell, Angus, to Michigan Technological University. Method for reducing macrosegregation in alloys. 4,462,454, Cl. 164-133.000.
Hemond, Harold C.; and Ezell, William H., to Rockwell International Corporation. Sonar vibration isolation transducer mount. 4,463,454, Cl. 367-173.000.
Henderson, James N.: *See*—
Donbar, Ken W.; Barbour, John J.; Henderson, James N.; and Bell, Anthony J., 4,463,146, Cl. 526-142.000.
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Henke, Donald L.: *See*—
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Henke, Mitchell C.; Bell, Gordon D.; Smith, Donald P.; and Archer, Virgil L., to Lincoln Manufacturing Company, Inc. Impingement food preparation apparatus. 4,462,383, Cl. 126-21.00A.
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Moller, Hinrich; Hase, Brigitte; Konrad, Gunther; Wilk, Hans-Christoph; and Zeidler, Ulrich, 4,463,006, Cl. 424-251.000.
Hensley, Steve L., to CVI Incorporated. Thermal blocked valve. 4,462,419, Cl. 137-340.000.
Henych, Ivo; and Fischer, Erwin, to George Fischer Ltd. Permanent mold with core pulling device. 4,462,455, Cl. 164-340.000.
Hepworth, Malcolm T.: *See*—
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Herb, Eugen; and Leibinger, Berthold, to Trumpf America, Inc. Method for simultaneous machining of a stack of plate-like workpieces. 4,462,147, Cl. 29-423.000.
Hercules Incorporated: *See*—
Elrick, Donald E., 4,462,848, Cl. 149-19.920.
Herring, Thomas B.: *See*—
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Herscovici, Hari; and Tarjan, Peter P., to Cordis Corporation. Dual channel cardiac pacer isolation circuit. 4,462,407, Cl. 128-419.0PG.
Hertell, Siegfried, to Barmag Barmer Maschinenfabrik Ag. Motor fuel feed pump. 4,462,302, Cl. 92-248.000.
Hess, Craig N.: *See*—
Blain, Maurice R.; and Hess, Craig N., 4,462,410, Cl. 128-727.000.
Hewlett-Packard Company: *See*—
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Hibyan, Edward S.: *See*—
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Hickling, David J., to Plessey Overseas Limited. Fasteners. 4,462,142, Cl. 403-329.000.
Hicks, Darrell D.: *See*—
Yankowsky, Anthony W.; Stanhope, Harry W.; and Hicks, Darrell D., 4,462,855, Cl. 156-307.300.
Hicks, Robert H.; Senko, Steve M.; Budenaers, Roland J.; and Teno, Richard L., to General Motors Corporation. Regeneration control system for a diesel engine exhaust particulate filter. 4,462,208, Cl. 60-286.000.
Hidalgo, Jaime; and Jost, Rolf, to Societe d'Assistance Technique pour Produits Nestle S.A. Composition for topical administration. 4,463,017, Cl. 424-359.000.
Hieftje, Gary M.: *See*—
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Higuchi, Takeru; and Nishihata, Toshiaki, to INTERx Research Corp. Method of increasing oral absorption of polar bioactive agents. 4,462,991, Cl. 424-177.000.
Hikichi, Akira: *See*—
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Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., to International Flavors & Fragrances Inc. Process for augmenting or enhancing the fresh air aroma of consumable materials and clothing and composition useful for same. 4,462,880, Cl. 204-161.000.
Hill, Joel B., Jr.: *See*—
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Hiller, Dorothee: *See*—
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Hillinger, George, to Alltrade Inc. Quartering edge. 4,462,441, Cl. 144-193.00D.
Hilti Aktiengesellschaft: *See*—
Uhlig, Raimer; and Lang, Gusztav, 4,462,729, Cl. 411-15.000.
Weingartner, Bernhard, 4,462,467, Cl. 173-105.000.
Himelhoch, Patricia J. Pistachio nut opener. 4,462,156, Cl. 30-113.200.
Hinsenkamp, James A.; and Walatka, Vernon V., Jr., to National Distillers and Chemical Corporation. Preparation of crystalline metal silicate and borosilicate compositions. 4,462,971, Cl. 423-277.000.
Hino, Minoru; Oshima, Takao; and Tachibana, Akihiro, to Sumitomo Chemical Company, Limited; and Tohto Kasei Co., Ltd. Modified epoxy resin composition. 4,463,134, Cl. 525-109.000.
Hintermeier, Karl: *See*—
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Hipp, James. Bidirectional fluid operated vibratory jar. 4,462,471, Cl. 175-296.000.
Hiraba, Kohtaroh. Method of preparation of pattern designs for printing. 4,462,683, Cl. 355-77.000.
Hirano, Toshinori; and Murase, Masakazu, to Terumo Corporation. Period measurement system. 4,463,425, Cl. 364-417.000.
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Hirose, Toshifumi; and Isayama, Katsuhiko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Pressure sensitive adhesive composition. 4,463,115, Cl. 524-188.000.
Hiroyuki, Kitamura: *See*—
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Hirt, Adam, to Robert Bosch GmbH. Magneto powered ignition system with ignition-operated speed limiting. 4,462,356, Cl. 123-335.000.
Hisasue, Michio: *See*—
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Hitachi, Ltd.: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,462,378, Cl. 123-571.000.
Fukui, Yutaka; Tobita, Yoshimitsu; Hataya, Fumio; Watanabe, Mitsuhiro; and Mase, Noriaki, 4,462,957, Cl. 376-327.000.
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,462,772, Cl. 418-55.000.
Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki; Kawanabe, Takao; and Tanabe, Isao, 4,463,073, Cl. 430-5.000.
Nakamura, Kenichi, 4,462,859, Cl. 310-198.000.
Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; Kanomata, Ichiro; Okudaira, Sadayuki; and Saida, Hiroji, 4,462,863, Cl. 156-643.000.
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.
Sugimoto, Shigeo; Minowa, Ryobei; and Saksi, Kozi, 4,462,222, Cl. 62-476.000.
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Tanabe, Yoshiyuki; Kashiwaya, Mineo; Hikichi, Akira; and Aochi, Yoshikazu, 4,462,367, Cl. 123-442.000.
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Yamamoto, Hiroshi; Shimizu, Noboru; Suenaga, Masahide; Tsukada, Yukihisa; and Takeura, Tooru, 4,462,881, Cl. 204-192.0EC.
Hitch, Robert J., to W. C. Bradley Enterprises, Inc. Universal adjustable replacement gas burner. 4,462,384, Cl. 126-41.00R.
Hitchcock, Malcolm C., to Rolls-Royce Limited. Thrust spoiler for aero engines. 4,462,207, Cl. 60-204.000.
Ho, Tae-Lok, to SCM Corporation. Process for making piperitone from plinols. 4,463,194, Cl. 568-343.000.
Hoberman, Henry D., to Albert Einstein College of Medicine of Yeshiva University a Division of Yeshiva University. Hemoglobin marker of alcoholism. 4,463,098, Cl. 436-67.000.
Hodges, Marvin P. Reflective film and method of applying same. 4,463,055, Cl. 428-458.000.
Hodson, Layne O. Adjustably alignable golf club. 4,462,595, Cl. 273-164.000.
Hoechst Aktiengesellschaft: *See*—
Back, Gunter, 4,462,678, Cl. 355-3.00R.
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Moraw, Roland; and Schaedlich, Gunther, 4,462,675, Cl. 355-3.00R.
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Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, to Titmus Eurocon Kontaktlinsen GmbH KG & Co. Contact lens and compositions. 4,463,148, Cl. 526-264.000.

Hoffman, John P.: *See*—
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Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,462,333, Cl. 118-723.000.

Hoffmann, Bernd; and Behme, Klaus-Jurgen, to Hoechst Aktiengesellschaft. Stabilization of polyether or polyester molding compositions against premature reaction. 4,463,189, Cl. 564-2.000.

Hoffmann-La Roche Inc.: *See*—
Boller, Arthur; Schadt, Martin; and Villiger, Alois, 4,462,923, Cl. 252-299.610.
Pauling, Horst; Wehrli, Christof; and Vorsanger, Jean-Jacques, 4,463,180, Cl. 548-303.000.

Hofmann, Bernhard: *See*—
Preisler, Eberhard; Hofmann, Bernhard; and Nolte, Gerhard, 4,462,912, Cl. 210-665.000.

Hohberg, Alfried; and Muschner, Udo, to Didier-Werke AG. Apparatus for supplying gas through the wall of a metallurgical container. 4,462,576, Cl. 266-220.000.

Holdridge, Robert B.; Taff, Douglas C.; and Yanda, William F. Modular solar greenhouse with elevated overhead heat storage material and movable insulation barriers and method and system for solar heating of attached living space using thermostat-controlled air circulation for harvesting heat. 4,462,390, Cl. 126-430.000.

Holley, Ralph N.: *See*—
Smith, Charles F.; Parks, George R.; Correa, Gustavo A.; and Holley, Ralph N., 4,462,714, Cl. 405-55.000.

Hollingshead, William S.: *See*—
Nowak, Edward N.; Hollingshead, William S.; and Muse, Joel, Jr., 4,463,198, Cl. 568-768.000.

Holmes, Arthur S.; and Ryan, James M., to Koch Process Systems, Inc. Distillative separations of gas mixtures containing methane, carbon dioxide and other components. 4,462,814, Cl. 62-17.000.

Holmstrom, Roy C., to Rockwell International Corporation. Wheel cover support pedestal. 4,462,639, Cl. 301-37.0SC.

Holt, William L.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,462,318, Cl. 110-238.000.

Holubka, Joseph W., to Ford Motor Company. Diblocked diisocyanate urea urethane oligomers and coating compositions comprising same. 4,463,143, Cl. 525-528.000.

Hom, Harvey K., to International Telephone and Telegraph Corporation. Planar N-way combiner/divider for microwave circuits. 4,463,326, Cl. 333-128.000.

Hon Corporation International: *See*—
Hon, David T., 4,462,606, Cl. 280-278.000.

Hon, David T., to Hon Corporation International. Foldable and portable vehicle. 4,462,606, Cl. 280-278.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hattori, Torao, 4,462,490, Cl. 192-0.076.
Kawasaki, Katsuyoshi; and Miyata, Jiro, 4,462,481, Cl. 180-215.000.
Kurata, Noboru, 4,462,350, Cl. 123-196.0CP.
Ozaki, Syunzaburo; and Niwa, Tooru, 4,462,355, Cl. 123-325.000.
Tsuboi, Masaharu, 4,462,482, Cl. 180-230.000.

Honeywell Inc.: *See*—
Forbes, Ronald L.; and Winkler, Richard G., 4,463,352, Cl. 340-825.050.
Kahnke, Joseph, 4,462,262, Cl. 73-861.050.

Hongo, Mikio: *See*—
Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki; Kawanabe, Takao; and Tanabe, Isao, 4,463,073, Cl. 430-5.000.

Honma, Akira: *See*—
Osaka, Hiroshi; Honma, Akira; and Kanai, Ryokichi, 4,463,376, Cl. 358-120.000.

Hood, Paul E.; and Pickens, John O., to Atlantic Richfield Company. Silicon carbide whisker composites. 4,463,058, Cl. 75-229.000.

Hooker, Michael A.: *See*—
Jayasinghe, Sarath S.; Hooker, Michael A.; and Spencer, Denis H. T., 4,462,807, Cl. 44-1.00R.

Hooks, John T., Jr., to Vought Corporation. Image processing system. 4,463,380, Cl. 358-160.000.

Horeschi, Giancarlo; and Barozzi, Gian P., to Tokyo Juki Industrial Co., Ltd. Type carrier return and platen line space device for typewriters. 4,462,709, Cl. 400-314.000.

Horetzke, John R. Detachable guard for keyholes. 4,462,233, Cl. 70-428.000.

Horiba, Ltd.: *See*—
Ikeda, Tosiaki, 4,463,260, Cl. 250-339.000.

Horii, Satoshi; Mizokami, Nariakira; and Kuwada, Yutaka, to Takeda Chemical Industries, Ltd. Process for producing 2-methyl cephem-2-em and 2-methylcephem-3-em derivitaves. 4,463,172, Cl. 544-027.000.

Horii, Yasuyuki: *See*—
Yoshii, Takashi; Horii, Yasuyuki; and Tama, Tomeski, 4,462,273, Cl. 74-745.000.

Horne, David R., to U.S. Philips Corporation. Imaging apparatus. 4,463,258, Cl. 250-334.000.

Horner, Jimmy M., to E-Systems, Inc. Delay line controlled frequency synthesizer. 4,463,321, Cl. 331-1.00R.

Hornung, Friedrich; Jundt, Wolfgang; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, to Robert Bosch GmbH. Method and apparatus for shutting off a power screwdriver. 4,463,293, Cl. 318-284.000.

Horodyaky, Andrew G.: *See*—
Kaminski, Joan M.; and Horodyaky, Andrew G., 4,462,809, Cl. 44-67.000.

Horwath, Robert O.; and Colonna, William J., to Nabisco Brands, Inc. Process for isomerizing L-glucose to L-fructose. 4,463,093, Cl. 435-94.000.

Horwitz, Christopher M., to Massachusetts Institute of Technology. Selective etching of aluminum. 4,462,882, Cl. 204-192.00E.

Hosoya, Nobukazu. Synchro separation circuit. 4,463,379, Cl. 358-154.000.

Hotani, Mitsuhiro, to Toyo Boseki Kabushiki Kaisha. Process and apparatus for the mercerization of slivers. 4,462,131, Cl. 8-151.200.

Hotger, Karl, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Mechanical sealing means for rotary fluid coupling. 4,462,619, Cl. 285-94.000.

Hotine, William; and Ziegler, John A. Rotary expander fluid pressure device. 4,462,774, Cl. 418-61.00B.

Houck, Robert J.: *See*—
Haylett, Lyle M.; Houck, Robert J.; and King, Kevin J., 4,463,434, Cl. 364-507.000.

Housako, Keiichi: *See*—
Baba, Nobuyuki; and Housako, Keiichi, 4,462,962, Cl. 422-58.000.

Howmedica, Inc.: *See*—
Jacobs, Carl H., 4,462,394, Cl. 128-92.00C.

Hoxan Corporation: *See*—
Kurasoka, Yasuo; and Sakao, Nobuo, 4,462,215, Cl. 62-78.000.

Hradel, Anna M., to Magnetic Peripherals, Inc. Diskette picker. 4,462,742, Cl. 414-280.000.

Huat, David T. K. Angle/level meter. 4,462,167, Cl. 33-339.000.

Hubbard, Raymond W.; and Hubbard, Thomas W. Meat processing machine. 4,462,139, Cl. 17-27.000.

Hubbard, Thomas W.: *See*—
Hubbard, Raymond W.; and Hubbard, Thomas W., 4,462,139, Cl. 17-27.000.

Hubel, Werner: *See*—
Disteldorf, Josef; Gras, Rainer; Schnurbusch, Horst; Hubel, Werner; and Wolf, Elmar, 4,463,154, Cl. 528-45.000.

Hudor, Andrew M., Jr.: *See*—
Soulliard, Charles; Ward, Herschel W.; Gass, Arthur D.; and Hudor, Andrew M., Jr., 4,463,221, Cl. 179-2.0EB.

Hudson's Bay Oil and Gas Company Limited: *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.

Huggard, Mark T., to Mobil Oil Corporation. Heat-resistant foamed polyesters. 4,462,947, Cl. 264-54.000.

Hughes Aircraft Company: *See*—
Pastor, Ricardo C.; Pastor, Antonio C.; Gorre, Luisa E.; and Chew, Remedios K., 4,462,970, Cl. 423-263.000.
Pastor, Ricardo C.; Pastor, Antonio C.; Gorre, Luisa E.; and Chew, Remedios K., 4,462,974, Cl. 423-335.000.

Hughes, David M.: *See*—
Cooper, Steven R.; Flanders, Thomas W.; and Hughes, David M., 4,463,231, Cl. 200-153.00J.

Hughes Tool Company: *See*—
Langowski, Faustyn C.; Berry, Joe R.; and Priest, Joseph R., 4,462,733, Cl. 414-22.000.

Hughes, William B., to Phillips Petroleum Company. Petroleum source rock identification. 4,463,096, Cl. 436-29.000.

Hull, Maury L.; and Davis, Rory R., to University of California, The Regents of the. Pedalling efficiency indicator. 4,463,433, Cl. 364-506.000.

Hull, Peter R., to General Electric Company. Gas turbine engine cooling airflow modulator. 4,462,204, Cl. 60-39.070.

Humphreys, Michael, to Electrak International Limited. Electrical distribution system. 4,462,650, Cl. 339-22.00R.

Hundley, Craig R. Beam and cylinder sound instrument. 4,462,295, Cl. 84-1.160.

Hunt, David A., to Union Carbide Corporation. Process for the preparation of carbofuran. 4,463,184, Cl. 549-470.000.

Hunter, Byron A., to Uniroyal, Inc. Blowing agent composition containing zinc formate and metal salt activator. 4,462,927, Cl. 252-350.000.

Hunter Douglas International N.V.: *See*—
Oskam, Herman, 4,462,452, Cl. 160-176.00R.

Hunter, William R.: *See*—
Kabler, Milton N.; Williams, Richard T.; Rife, Jack C.; Hunter, William R.; Kirkland, Johnny P.; and Lien, Neil C., 4,462,689, Cl. 356-333.000.

Hurter, Max, to Babcock Electro-Mechanical, Inc. Electromagnetic relay. 4,463,331, Cl. 335-202.000.

Hutchison, Herbert L.; and Rose, Byron W., to Crane Plastics, Inc. Synthetic resin panels joined by an integral hinge having dual durometer plies. 4,463,046, Cl. 428-156.000.

Hymas, Theo A.: *See*—
Ware, Douglas R.; and Hymas, Theo A., 4,462,995, Cl. 424-200.000.

Iannelli, Frank M., to Gerlach Industries. Cooling sensor for refrigeration system. 4,462,220, Cl. 62-201.000.
Iannucci, Vincent A., to Rockwell International Corporation. Yarn bobbin winding machine. 4,462,552, Cl. 242-42.000.
Ichikawa, Masaru; Shikakura, Kohichi; Sekizawa, Kazuhiko; and Tanaka, Kazuaki, to Sagami Chemical Research Center. Process for producing oxygen-containing hydrocarbon compounds. 4,463,105, Cl. 518-716.000.
ICI Pharma: *See*—
Jung, Frederic H., 4,463,173, Cl. 544-27.000.
Idogaki, Takaharu: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; and Idogaki, Takaharu, 4,462,377, Cl. 123-571.000.
Igashira, Toshihiko: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; and Idogaki, Takaharu, 4,462,377, Cl. 123-571.000.
Ikeda, Tomoaki: *See*—
Kitajima, Masao; Seshimoto, Osamu; Namiki, Tomizo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Mizobuchi, Yuzo, 4,463,083, Cl. 430-273.000.
Ikeda, Tosiaki, to Horiba, Ltd. Flame detector. 4,463,260, Cl. 250-339.000.
Ikeda, Yasuhisa: *See*—
Tokunaga, Yukio; Ikeda, Yasuhisa; Seto, Tadao; and Shimazaki, Yoshikazu, 4,463,034, Cl. 427-256.000.
Ikeda, Yoshinori, to Canon Kabushiki Kaisha. Apparatus for controlling toner density. 4,462,680, Cl. 355-14.00D.
Illinois Tool Works Inc.: *See*—
Allen, Ronald J., 4,462,190, Cl. 52-58.000.
Knohl, Rudolph E., 4,462,730, Cl. 411-371.000.
Imai, Hisashi: *See*—
Fujimoto, Mitsuru; Imai, Hisashi; and Matumoto, Takashi, 4,462,776, Cl. 425-31.000.
Imai, Masaya: *See*—
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,462,772, Cl. 418-55.000.
Imai, Tamotsu, to UOP Inc. Selective oligomerization of olefins. 4,463,212, Cl. 585-530.000.
Imperial Chemical Industries PLC: *See*—
Jones, Derrick J.; and Oldham, Keith, 4,463,005, Cl. 424-249.000.
Lafeber, Andre ; and Wilson, Frank R., 4,462,229, Cl. 68-212.000.
Ina Seito Co., Ltd.: *See*—
Takuji, Koyanagi; Nobuhiro, Ono; and Hiroyuki, Kitamura, 4,463,041, Cl. 428-35.000.
Inaba, Hajimu; and Inagaki, Shigemi, to Fujitsu Fanuc Ltd. Industrial robot. 4,462,748, Cl. 414-738.000.
Inaba, Nobukatsu; and Yoshida, Satoshi, to Japan Organo Co., Ltd. Filler for electromagnetic filters. 4,462,906, Cl. 210-222.000.
Inadomi, Takafumi: *See*—
Koga, Yoshio; and Inadomi, Takafumi, 4,463,390, Cl. 360-10.300.
Inagaki, Mitsukane: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,462,491, Cl. 192-84.00R.
Inagaki, Shigemi: *See*—
Inaba, Hajimu; and Inagaki, Shigemi, 4,462,748, Cl. 414-738.000.
Inanaga, Takugi: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,463,394, Cl. 360-96.500.
Incrediball, Inc.: *See*—
Morgan, Robert C., 4,462,589, Cl. 273-60.00R.
Industrial Design Engineering Associates, Ltd.: *See*—
DeVale, Donald P.; Wilbrandt, Howard B.; Tomlinson, Dennis E.; and Shah, Ashish, 4,463,429, Cl. 364-466.000.
Industrial Maintenance Systems, Inc.: *See*—
Zatezalo, John M.; and Spalla, Lucian J., 4,463,438, Cl. 364-715.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Falconieri, Remo, 4,462,707, Cl. 400-225.000.
Ingersoll-Rand Company: *See*—
Gagnet, Thomas R., 4,462,570, Cl. 254-268.000.
Inglis, James J., to Davis Tool & Engineering Company, Inc. Flywheel. 4,462,269, Cl. 74-572.000.
Inmont Corporation: *See*—
Hays, Byron G.; and Maguire, Philip L., 4,462,833, Cl. 106-23.000.
Inomata, Koichiro; Hasegawa, Michio; and Kobayashi, Tadahiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Low-loss amorphous alloy. 4,462,826, Cl. 75-123.00B.
Inotek-Westmoreland Venture: *See*—
Westmoreland, Julius C., 4,462,768, Cl. 417-518.000.
Inoue, Eisuke: *See*—
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.
Inoue, Hidefumi, to Jidosha Kiki Co., Ltd. Deceleration sensing valve assembly for vehicle brake. 4,462,641, Cl. 303-24.00C.
Inoue, Kazuo: *See*—
Nishiura, Yoshikazu; Mineyama, Takitsugu; and Inoue, Kazuo, 4,463,440, Cl. 364-900.000.
Inoue, Masaru: *See*—
Okuhara, Akira; Kotaka, Yasuyosi; Nishio, Masakazu; Sato, Susumu; Watanabe, Isamu; and Inoue, Masaru, 4,463,019, Cl. 426-17.000.
Inoue, Nobuhiro: *See*—
Fushiya, Fusao; and Inoue, Nobuhiro, 4,462,381, Cl. 125-4.000.
Institut de Recherches de la Sigerurgie Francaise: *See*—
Roth, Jean-Luc; and Sierpinski, Herve, 4,462,792, Cl. 432-11.000.
Institut Francais du Petrole: *See*—
Derries, Michel; and Cosyns, Jean, 4,463,206, Cl. 585-483.000.
Falcimaigne, Jean, 4,462,717, Cl. 405-195.000.
Institut National de la Sante et de la Recherche Medicale: *See*—
Jolles, Pierre; and Migliore-Samour, Danielc, 4,462,990, Cl. 424-177.000.
Instrument AB Scanditronix: *See*—
Brahme, Anders, 4,463,266, Cl. 250-505.100.
Instrument Flight Research: *See*—
Witt, Frank, 4,462,661, Cl. 350-331.00R.
Instrumentation Laboratory Inc.: *See*—
Smith, Stanley B., Jr.; and Hieftje, Gary M., 4,462,685, Cl. 356-307.000.
Intermountain Research & Development: *See*—
Pfeffer, Henry A., III; and Fradkin, Judith N., 4,462,794, Cl. 432-14.000.
International Business Machines Corporation: *See*—
Adler, Roy L.; and Hassner, Martin, 4,463,344, Cl. 340-347.0DD.
Bhattacharya, Somnath; Chance, Dudley A.; Koopman, Nicholas G.; and Ray, Sudipta K., 4,463,059, Cl. 428-620.000.
Bitaillou, Alex; Masson, Jean; and Lemoine, Jean-Marie, 4,462,534, Cl. 228-180.00A.
Bushaw, Kenneth A.; Branson, William L; Rehage, Ted A.; and Shook, Frankie S., 4,463,417, Cl. 364-200.000.
Cavill, Barry R., 4,463,435, Cl. 364-519.000.
Czyszczewski, Joseph S.; Pascoe, Robert A.; and Stafford, James M., 4,462,701, Cl. 400-3.000.
Dachowski, Richard P.; and Motola, Patrick D., 4,463,442, Cl. 364-900.000.
Daniels, Paul R.; Moore, Daniel J.; and Nguyen, Ha H., 4,463,444, Cl. 364-900.000.
Fletcher, Robert P., 4,463,420, Cl. 364-200.000.
Geipel, Henry J., Jr.; Troutman, Ronald R.; and Wurstthorn, John M., 4,462,151, Cl. 29-576.00B.
Goddard, Robert D.; Schomburg, Robert R.; and Wohler, Wayne L., 4,463,386, Cl. 358-261.000.
Judd, Ian D., 4,463,288, Cl. 315-371.000.
Langdon, Glen G., Jr.; and Rissanen, Jorma J., 4,463,342, Cl. 340-347.0DD.
Mattson, Richard L.; and Rodriguez-Rosell, Juan A., 4,463,424, Cl. 364-300.000.
Meagher, Ralph E.; and Ostergren, Carl D., 4,462,462, Cl. 165-80.00C.
O'Quin, John T., II; Vossman, Robert A.; and Wood, Rebecca S., 4,463,418, Cl. 364-200.000.
Weinberger, Arnold, 4,463,439, Cl. 364-784.000.
International Design Corporation: *See*—
Lynch, Thomas J.; and Pigman, John H., 4,462,168, Cl. 33-492.000.
International Environmental Corporation: *See*—
Braver, Alvin S., 4,462,460, Cl. 165-26.000.
International Flavors & Fragrances Inc.: *See*—
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,462,880, Cl. 204-161.000.
International Harvester Co.: *See*—
Mastro, James R., 4,462,477, Cl. 180-24.020.
International Telephone and Telegraph Corporation: *See*—
Caddick, Gary R.; and Guest, Philip Q., Jr., 4,463,426, Cl. 364-424.000.
Hom, Harvey K., 4,463,326, Cl. 333-128.000.
INTERx Research Corp.: *See*—
Higuchi, Takeru; and Nishihata, Toshiaki, 4,462,991, Cl. 424-177.000.
Intradym Maschinen AG: *See*—
Egger, Hans R.; and Vogler, Rudolf, 4,462,719, Cl. 406-64.000.
Inui, Toshiharu: *See*—
Kurata, Masami; and Inui, Toshiharu, 4,462,704, Cl. 400-120.000.
Irontite Products Co., Inc.: *See*—
Silvey, Fred H.; and Smith, Jeffrey G., 4,462,726, Cl. 408-76.000.
Irvin, Donald E.: *See*—
Wenstrom, Roger A.; Irvin, Donald E.; MacKay, George L.; and Robinson, Hugh A., 4,462,854, Cl. 156-250.000.
Irving, Edward, to Ciba-Geigy Corporation. Three component, carboxyl-containing compositions comprising dimercaptan. 4,463,169, Cl. 528-376.000.
Irwin Measuring Tool Company: *See*—
Cohen, Howard; and Pakus, Edward, 4,462,160, Cl. 33-138.000.
Isayama, Katsuhiko: *See*—
Hirose, Toshifumi; and Isayama, Katsuhiko, 4,463,115, Cl. 524-188.000.
Iscar Ltd.: *See*—
Satran, Amir; and Brasey, Andre, 4,462,725, Cl. 407-92.000.
Ishida, Takashi; and Tominari, Noboru, to Mikuni Kogyo Kabushiki Kaisha. Throttle valve. 4,462,358, Cl. 123-337.000.
Ishii, Fumio: *See*—
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,463,086, Cl. 430-553.000.
Ishii, Yasunobu; Asai, Kazuyoshi; and Kurumada, Katsuhiko, to Nippon Telegraph & Telephone Public Corp. Field effect transistor with combination Schottky-junction gate. 4,463,366, Cl. 357-22.000.
Ishikura, Tomoyuki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Tatsuta, Kuniaki; Ishikura, Tomoyuki; Okamoto, Rokuro; Yamamoto, Masao; and Kiyoshima, Kohki, 4,463,171, Cl. 536-7.100.

Iso "METALURGKOMPLEKT": *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.

Isobe, Toshiaki; and Ohkawa, Nobuhisa, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for controlling fuel supply of an internal combustion engine. 4,462,375, Cl. 123-491.000.

Isoyama, Eizo: *See*—
Uchiyama, Toshimitsu; Isoyama, Eizo; Takenaka, Hiroichi; and Kaji, Masayuki, 4,462,842, Cl. 148-6.15R.

Issa, Darrell E.: *See*—
Adkins, Joey B.; and Frantz, Jack W., 4,463,340, Cl. 340-64.000.

Itaya, Keiji, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic copying machine. 4,462,679, Cl. 355-14.0CH.

Ito, Daisuke, to Tokyo Shibaura Denki Kabushiki Kaisha. Cryostat. 4,462,214, Cl. 62-45.000.

Ito, Hiroshi: *See*—
Kobayashi, Nobuyuki; Ito, Hiroshi; and Kuma, Takahide, 4,462,360, Cl. 123-339.000.

Ito, Kanichi; Hirayama, Yoshio; and Takeuchi, Ryoichi, to Ebara Corporation. Compositing apparatus. 4,462,695, Cl. 366-345.000.

Ito, Tadao; and Hashimoto, Akio, to Nippon Light Metal Company Limited. Aluminum alloy for casting. 4,462,961, Cl. 420-534.000.

Ito, Yoshikazu, to Nissan Motor Company, Limited. Screw driver apparatus. 4,462,283, Cl. 81-57.370.

Itoh, Hiroshi: *See*—
Kobayashi, Nobuyuki; and Itoh, Hiroshi, 4,462,374, Cl. 123-489.000.

ITT Industries, Inc.: *See*—
Belart, Juan, 4,462,300, Cl. 91-384.000.
Carlsson, Valdemar; and Szendroi, Baliat, 4,462,766, Cl. 417-430.000.

Ivanov, Assen B.: *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.

Iwahashi, Haruo: *See*—
Tamura, Akihiko; Shukuri, Katsuhiro; Kawamoto, Kiyoaki; and Iwahashi, Haruo, 4,463,284, Cl. 315-158.000.

Iwami, Isamu: *See*—
Nogami, Sumitaka; Wakabayashi, Tsuneo; Oono, Eiichi; Kitahama, Yoshiharu; and Iwami, Isamu, 4,463,162, Cl. 528-190.000.

Iwamoto, Masatami: *See*—
Okamoto, Kouichi; Oishi, Norio; Sakuyama, Masaki; Nomura, Tatsuei; Yamada, Tadatoshi; and Iwamoto, Masatami, 4,462,152, Cl. 29-598.000.

Iwasaki, Shinichiro, to Aisin Seiki Kabushiki Kaisha. Single conductor multi-frequency electric wiring system for vehicles. 4,463,341, Cl. 340-310.00A.

Iwata, Takayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Refrigeration system. 4,462,219, Cl. 62-196.100.

Izumina, Tatsuya: *See*—
Kajiura, Koichi; Edanami, Kozo; Onoki, Seiji; Izumina, Tatsuya; and Kumeda, Yasuo, 4,463,350, Cl. 340-825.010.

J. A. Richards Company: *See*—
Richards, Robert E., 4,462,243, Cl. 72-481.000.

Jackson, Maurus E. Fuel injection system. 4,462,372, Cl. 123-452.000.

Jackson, O. L.; and Graham, Noah F. Compacting device. 4,462,310, Cl. 100-219.000.

Jacobs, Carl H., to Howmedica, Inc. Intramedullary canal seal for cement pressurization. 4,462,394, Cl. 128-92.00C.

Jacobs, Morton: *See*—
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,462,535, Cl. 228-184.000.

Jacobson, Allan J.: *See*—
Johnson, Jack W.; and Jacobson, Allan J., 4,463,175, Cl. 544-225.000.

Jacobson, William D.: *See*—
Langley, Lawrence W.; Wedman, Leonard N.; and Jacobson, William D., 4,463,299, Cl. 318-662.000.

Jacyno, Henry: *See*—
Ernster, Peter J.; and Jacyno, Henry, 4,462,694, Cl. 366-205.000.

Jahnke, Frederick C.; and Muenger, James R., to Texaco Development Corporation. Gas cooler for production of saturated or superheated steam, or both. 4,462,339, Cl. 122-7.00R.

Jakobsen, Kjell M.: *See*—
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Lars G., 4,462,950, Cl. 264-292.000.

Jakowicki, Henry. Coping and deck system for a swimming pool. 4,462,125, Cl. 4-507.000.

Jakubowski, Zbigniew L.: *See*—
Freckman, William G.; Jakubowski, Zbigniew L.; Bunge, Richard H.; French, James C.; and Balta, Lucia E., 4,463,182, Cl. 549-264.000.

Janossy, Jorant: *See*—
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.

Japan Organo Co., Ltd.: *See*—
Inaba, Nobukatsu; and Yoshida, Satoshi, 4,462,906, Cl. 210-222.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; Fujimaki, Tatsuo; Yamaguchi, Shinsuke; and Tomita, Seisuke, 4,463,133, Cl. 525-99.000.

Jarrett, Boaz A., to Lucas Industries Limited. Fuel injection pumping apparatus. 4,462,370, Cl. 123-450.000.

Jasys, Vytautas J., to Pfizer Inc. Bis-esters of dicarboxylic acids with amoxicillin and certain hydroxymethylpenicillanate 1,1-dioxides. 4,462,934, Cl. 260-239.100.

Jayasinghe, Sarath S.; Hooker, Michael A.; and Spencer, Denis H. T., to Coal Industry (Patents) Limited. Method of dechlorinating coal. 4,462,807, Cl. 44-1.00R.

Jenkins, Carrell L. Paper batch selector. 4,462,736, Cl. 414-114.000.

Jenne, Gustav. Ram head for self-driven pneumatic ram drills. 4,462,468, Cl. 173-121.000.

Jennings, Alan K.: *See*—
Mayne, David W.; and Jennings, Alan K., 4,463,300, Cl. 318-687.000.

Jennings, Thomas J.: *See*—
Specker, Lawrence J.; Jennings, Thomas J.; and Connors, Michael P., 4,462,563, Cl. 244-122.0AG.

Jessup, Peter J.; and Feldman, Nicholas, to Exxon Research & Engineering Co. Zirconium-cerium additives for residual fuel oil. 4,462,810, Cl. 44-68.000.

Jettmar, Werner; Olschner, Hans; and Junge, Helmut, to BASF Aktiengesellschaft. Less abrasive pigment or printing ink, and method of reducing abrasion caused by pigments and printing inks. 4,462,832, Cl. 106-23.000.

Jidosha Kiki Co., Ltd.: *See*—
Inoue, Hidefumi, 4,462,641, Cl. 303-24.00C.

Johannessen, Marie: *See*—
Diedrichsen, Allan; Johannessen, Marie; and Taeg, Peter, 4,462,980, Cl. 424-1.100.

John Wyeth & Brother Limited: *See*—
Shepherd, Robin G., 4,463,177, Cl. 546-221.000.

John Zink Company: *See*—
Dinsmore, Harold L.; and Young, Jon W., Jr., 4,462,811, Cl. 55-18.000.

Johnsen, Kenneth N.: *See*—
Sarich, Tony R.; Johnsen, Kenneth N.; and McKay, Michael L., 4,462,760, Cl. 417-54.000.

Johnson, George W., to Lockheed Corporation. Erectable and retractable support for rolling conductor track. 4,462,565, Cl. 248-51.000.

Johnson, Jack W.; and Jacobson, Allan J., to Exxon Research & Engineering Co. Molybdenum trioxide layered compounds. 4,463,175, Cl. 544-225.000.

Johnson, Lanny L. Arthroscopic ligamentous and capsular fixation system. 4,462,395, Cl. 128-92.00B.

Johnson, Peter E.; and Young, James. Plate feed apparatus. 4,462,745, Cl. 414-330.000.

Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., to Eli Lilly and Company. Process for production antibiotic A53868. 4,463,092, Cl. 435-70.000.

Johnson, Thomas A.; and Ford, Michael E., to Air Products and Chemicals, Inc. Production of noncyclic polyalkylene polyamines. 4,463,193, Cl. 564-479.000.

Johnson, Thomas H., to Shell Oil Company. Arene alkylation with metal oxide-tantalum halide/oxide catalysts. 4,463,207, Cl. 585-462.000.

Johnston, David E., to George Angus & Company Limited. Rotary fluid seals. 4,462,600, Cl. 277-25.000.

Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., to AMCA International Corporation. Apparatus and process for manufacture of tunnel tubes. 4,462,535, Cl. 228-184.000.

Jolles, Pierre; and Migliore-Samour, Daniele, to Institut National de la Sante et de la Recherche Medicale. Biologically active substances, their obtainment from human casein and compositions containing said substances. 4,462,990, Cl. 424-177.000.

Jones, Derrick A.: *See*—
Burgio, Paul A.; Jones, Derrick A.; and Abel, Allen J., 4,462,402, Cl. 128-303.00R.

Jones, Derrick J.; and Oldham, Keith, to Imperial Chemical Industries PLC. Bicyclic guanidines. 4,463,005, Cl. 424-249.000.

Jones, Evan T. R.: *See*—
Fontaine, Paul I.; Jones, Evan T. R.; and Batham, John K., 4,462,823, Cl. 75-58.000.

Jones, Marston. Orthodontic bite jumping device. 4,462,800, Cl. 433-19.000.

Jordan, William A.: *See*—
Fritsch, Kenneth L.; Jordan, William A.; and Lopez, Hugo A., 4,463,075, Cl. 430-23.000.

Jore, Torleif N., to Norzink A/S. Zinc anode alloy for sacrificial anodes. 4,462,960, Cl. 420-519.000.

Josef Kauferle KG: *See*—
Kauferle, Josef, deceased; and Lutzke, Werner, 4,462,237, Cl. 72-324.000.

Joseph Galkin Corporation: *See*—
Block, Charles; and Mintz, Leon, 4,462,530, Cl. 226-156.000.

Jost, Rolf: *See*—
Hidalgo, Jaime; and Jost, Rolf, 4,463,017, Cl. 424-359.000.

Jost-Werke GmbH: *See*—
Dreyer, Hans; and Muller, Gerald, 4,462,612, Cl. 280-766.100.

Joyce, Arthur B., to Dana Corporation. Method of axial retention of gear on shaft. 4,462,148, Cl. 29-447.000.

Judd, Ian D., to International Business Machines Corporation. Cathode ray tube drive circuitry. 4,463,288, Cl. 315-371.000.

Jukobudo, Inc.: *See*—
Carty, Edwin J., Jr., 4,462,593, Cl. 273-84.00R.
Julien, Claude: *See*—
Lesous, Jean M.; Lerude, Gerard; and Julien, Claude, 4,463,236, Cl. 200-295.000.
Jundt, Wolfgang: *See*—
Hornung, Friedrich; Jundt, Wolfgang; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,463,293, Cl. 318-284.000.
Jung, Frederic H., to ICI Pharma. Cephalosporin derivatives. 4,463,173, Cl. 544-27.000.
Junge, Helmut: *See*—
Jettmar, Werner; Olschner, Hans; and Junge, Helmut, 4,462,832, Cl. 106-23.000.
Junge, Norbert E. A.; and Kraan, Gerrit, to Van Leer Verpackungen GmbH. Container made from a laminate of fiber layers. 4,462,536, Cl. 229-5.500.
Jurek, Dennis J.: *See*—
Schmeling, William H.; and Jurek, Dennis J., 4,463,244, Cl. 219-110.000.
Justice, James W. H., to North American Philips Lighting Corporation. Lightweight electronic ballast for fluorescent lamps. 4,463,286, Cl. 315-219.000.
Kabler, Milton N.; Williams, Richard T.; Rife, Jack C.; Hunter, William R.; Kirkland, Johnny P.; and Lien, Neil C., to Baker Manufacturing Company. Wide band scanning monochromator. 4,462,689, Cl. 356-333.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Gyoda, Toshio, 4,462,554, Cl. 242-107.200.
Nishimura, Yuji; and Tanaka, Hideki, 4,462,613, Cl. 280-804.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,462,491, Cl. 192-84.00R.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Suzuki, Toshihiko; and Matsui, Noboru, 4,462,930, Cl. 252-519.000.
Kachnik, Joseph E. Method of propping fractures in subterranean formations. 4,462,466, Cl. 166-280.000.
Kahnke, Joseph, to Honeywell Inc. Fluid flow sensing system. 4,462,262, Cl. 73-861.050.
Kai, Toshio: *See*—
Watanabe, Teishiro; Tsunoi, Makoto; Kai, Toshio; Shiota, Hiroshi; Nakabayashi, Hiroshi; Tsutsumi, Tadayoshi; and Sakai, Ryuichi, 4,462,777, Cl. 425-87.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Cassens, Nicholas, Jr., 4,463,100, Cl. 501-108.000.
Kaiser, Harry: *See*—
Brammer, Hartmut; and Kaiser, Harry, 4,462,347, Cl. 123-146.50A.
Kaji, Masayuki: *See*—
Uchiyama, Toshimitsu; Isoyama, Eizo; Takenaka, Hiroichi; and Kaji, Masayuki, 4,462,842, Cl. 148-6.15R.
Kajita, Isao: *See*—
Azuma, Kenkoku; Kajita, Isao; and Usui, Akaru, 4,462,965, Cl. 422-186.080.
Kajiura, Koichi; Edanami, Kozo; Osoki, Seiji; Izumina, Tatsuya; and Kumeda, Yasuo. Communication system having designated transmission lines. 4,463,350, Cl. 340-825.010.
Kakuta, Yoshiyuki: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,462,549, Cl. 239-333.000.
Kaler, Ward S.: *See*—
O'Brien, Larry S.; and Kaler, Ward S., 4,462,963, Cl. 422-78.000.
Kallio, William R., to Noranda Mines Limited. Hood assembly for a metallurgical converter. 4,462,575, Cl. 266-158.000.
Kamegaya, Sigeru: *See*—
Fujii, Hiroshi; and Kamegaya, Sigeru, 4,462,351, Cl. 123-198.00F.
Kameyama, Kazuhide; Kiyofuji, Takahiro; and Shigeyama, Yukinori, to Nippon Steel Corporation. Transport roll for transporting hot material and train of such transport rolls. 4,462,456, Cl. 164-448.000.
Kamimura, Tetsuro: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,463,394, Cl. 360-96.500.
Kaminski, Joan M.; and Horodysky, Andrew G., to Mobil Oil Corporation. Metal-containing products of phosphosulfurized amides and lubricants containing same. 4,462,809, Cl. 44-67.000.
Kanai, Ryokichi: *See*—
Osaka, Hiroshi; Honma, Akira; and Kanai, Ryokichi, 4,463,376, Cl. 358-120.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Hirose, Toshifumi; and Isayama, Katsuhiko, 4,463,115, Cl. 524-188.000.
Kaneko, Yutaka: *See*—
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,463,086, Cl. 430-553.000.
Kanno, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Air-to-fuel ratio control method and apparatus. 4,462,373, Cl. 123-489.000.
Kanomata, Ichiro: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; Kanomata, Ichiro; Okudaira, Sadayuki; and Saida, Hiroji, 4,462,863, Cl. 156-643.000.
Kaplan, Leonard A., to RCA Corporation. Power amplifier circuit employing field-effect power transistors. 4,463,318, Cl. 330-251.000.
Kaplan, Lester J.: *See*—
Collins, Robert J.; Kaplan, Lester J.; Ludens, James H.; and Von Voigtlander, Philip F., 4,463,013, Cl. 424-274.000.
Karakolev, Kolyo G.: *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.
Karger, Robert, to Vereinigte Elektrizitatswerke Westfalen AG. Method for the treatment of chloride-containing waste waters. 4,462,976, Cl. 423-481.000.
Karle, Anton; and Laufer, Helmut, to Robert Bosch GmbH. Apparatus for generating a fuel quantity signal. 4,462,361, Cl. 123-357.000.
Kashiwaya, Mineo: *See*—
Tanabe, Yoshiyuki; Kashiwaya, Mineo; Hikichi, Akira; and Aochi, Yoshikazu, 4,462,367, Cl. 123-442.000.
Kassabov, Nikola K.; and Dakovski, Lyudmil G., to V M E I "Lenin". Register arithmetic device. 4,463,441, Cl. 364-900.000.
Kastner, Ralph E.: *See*—
Hamill, Robert L.; and Kastner, Ralph E., 4,462,942, Cl. 260-112.50R.
Kastner, Ralph M.: *See*—
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., 4,463,092, Cl. 435-70.000.
Kaszab, Istvan: *See*—
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.
Kato, Katsunori: *See*—
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,463,086, Cl. 430-553.000.
Kato, Masanori: *See*—
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,462,379, Cl. 123-569.000.
Kato, Shozo; and Ujimoto, Yasuhiko, to Sumitomo Aluminium Smelting Company, Limited. Conductor arrangement of electrolytic cells for producing aluminum. 4,462,885, Cl. 204-243.00M.
Kato, Taketoshi: *See*—
Nakano, Hirotaka; Morita, Hiroshi; and Kato, Taketoshi, 4,463,216, Cl. 136-256.000.
Kato, Toshikazu: *See*—
Motoyama, Kazuyasu; and Kato, Toshikazu, 4,463,397, Cl. 360-137.000.
Katryniok, Detlef: *See*—
Ruch, Jean; Katryniok, Detlef; Pack, Hugo; and Tillmann, Heinz-Gunther, 4,463,064, Cl. 429-27.000.
Katzman, Lawrence; and Briggin, Edward, to Kaz Manufacturing Co., Inc. Non-spitting noiseless electric steam vaporizer. 4,463,248, Cl. 219-284.000.
Kaucic, Robert A.: *See*—
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,462,535, Cl. 228-184.000.
Kauferle, Josef, deceased (by Kauferle, Viktoria, heiress); and Lutzke, Werner, to Josef Kauferle KG. Method of bending frame material for the production of compound plates, particularly compound glass panes. 4,462,237, Cl. 72-324.000.
Kauferle, Viktoria, heiress: *See*—
Kauferle, Josef, deceased; and Lutzke, Werner, 4,462,237, Cl. 72-324.000.
Kaufman, Arthur: *See*—
Cohn, J. Gunther; Feigenbaum, Haim; and Kaufman, Arthur, 4,463,068, Cl. 429-34.000.
Kaup, Ralph J.: *See*—
Warwick, Edward H.; Parker, Donald L.; and Kaup, Ralph J., 4,462,487, Cl. 192-4.00A.
Kawabata, Kohji: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,462,999, Cl. 424-246.000.
Kawaguchi, Yasuyoshi; Aoyama, Hideki; and Mineki, Eiji, to Bridgestone Corporation. Pneumatic tires. 4,462,448, Cl. 152-354.00R.
Kawai, Hisasi: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; and Idogaki, Takaharu, 4,462,377, Cl. 123-571.000.
Kawakami, Ryusi; and Masumura, Tadahiro, to C. Itoh Feed Mills Co., Ltd. Farrowing pen for domestic animals. 4,462,336, Cl. 119-20.000.
Kawamoto, Kiyoaki: *See*—
Tamura, Akihiko; Shukuri, Katsuhiro; Kawamoto, Kiyoaki; and Iwahashi, Haruo, 4,463,284, Cl. 315-158.000.
Kawanabe, Takao: *See*—
Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki; Kawanabe, Takao; and Tanabe, Isao, 4,463,073, Cl. 430-5.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Maeda, Takuya; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Kubotani, Atsuyoshi, 4,462,793, Cl. 432-14.000.
Kawasaki, Katsuyoshi; and Miyata, Jiro, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular floor structure. 4,462,481, Cl. 180-215.000.
Kaz Manufacturing Co., Inc.: *See*—
Katzman, Lawrence; and Briggin, Edward, 4,463,248, Cl. 219-284.000.
Kazama, Toyoki; and Shimatani, Michiro, to Fuji Electric Company, Ltd. Method for generating substrates of electrophotographic photosensitive materials. 4,462,862, Cl. 156-643.000.
Kazimer, Ted. Control unit for an electrical musical instrument. 4,462,294, Cl. 84-1.010.
Kearney, Mark B., to General Motors Corporation. Operational amplifier circuit. 4,463,319, Cl. 330-258.000.
Keely, Jerry A.: *See*—
Crea, David A.; and Keely, Jerry A., 4,462,973, Cl. 423-322.000.

Keen, Ralph: *See*—
Thompson, Stephen W.; and Keen, Ralph, 4,462,847, Cl. 148-174.000.

Keenan, William M.; McGarry, Sheldon; and Bassett, James G., Jr., to United States Steel Corporation. Method for minimizing slag carryover. 4,462,574, Cl. 266-45.000.

Keesen, Heinz: *See*—
Prater, Klaus; and Keesen, Heinz, 4,462,926, Cl. 252-315.100.

Kelley, Everett J., to Rohm and Haas Company. Acrylic or methacrylic terminated oligomers. 4,463,150, Cl. 526-292.400.

Kelly, Lorenzo J.: *See*—
Castellanos, Juan D.; Cardenas, Enrique C.; Kelly, Max B.; Kelly, Lorenzo J.; and Glicken, Irving, 4,462,879, Cl. 204-140.000.

Kelly, Max B.: *See*—
Castellanos, Juan D.; Cardenas, Enrique C.; Kelly, Max B.; Kelly, Lorenzo J.; and Glicken, Irving, 4,462,879, Cl. 204-140.000.

Kendall Company, The: *See*—
Shah, Kishore R., 4,462,665, Cl. 351-160.00H.
Wichman, Cynthia A., 4,462,396, Cl. 128-132.00D.

Kennel, George W., to Dorr-Oliver Incorporated. Surface skimmer means for settling tank. 4,462,909, Cl. 210-525.000.

Kenworthy, Charles A. Racket string filament. 4,462,591, Cl. 273-73.00D.

Kerotest Manufacturing Corp.: *See*—
Owoc, James R.; and Tremblay, Richard P., 4,462,422, Cl. 137-557.000.

Kerr, James F., to Material Control, Inc. Damaged conveyor belt detector. 4,462,523, Cl. 198-810.000.

Kersten, Hilde; and Magerlein, Helmut, to Akzo NV. Self curing cationic amide-group-containing aminoures resin, if necessary with urethane groupings. 4,463,157, Cl. 528-68.000.

Key, Gerald. Knock-down cupboard. 4,462,647, Cl. 312-257.0SM.

Keyes, Marion A.; and Thompson, William L., to Babcock & Wilcox Company, The. Mass and velocity flowmeter. 4,462,261, Cl. 73-861.020.

Kibler, Richard W., to Firestone Tire & Rubber Company, The. Polyether polyurethane elastomers. 4,463,155, Cl. 528-61.000.

Kida, Akira: *See*—
Samejima, Masayoshi; Hirata, Goichi; Koida, Yoshiyuki; Kobayashi, Yoshinori; and Kida, Akira, 4,462,982, Cl. 424-35.000.

Kierst, Reiner: *See*—
Brauers, Bert; Kierst, Reiner; and Morsbach, Martin, 4,462,602, Cl. 277-139.000.

Kikkoman Corporation: *See*—
Nishizawa, Yoshihiko; Takezawa, Taihei; and Shinohara, Takashi, 4,463,024, Cl. 426-533.000.
Okuhara, Akira; Kotaka, Yasuyosi; Nishio, Masakazu; Sato, Susumu; Watanabe, Isamu; and Inoue, Masaru, 4,463,019, Cl. 426-17.000.

Kiko, Frederick J.; and Barzen, Thomas J., to GTE Automatic Electric Inc. Negative inductance multiplier circuit including temperature compensation. 4,463,307, Cl. 323-356.000.

Kikuchi, Noribumi; Suzuki, Yasuo; Onishi, Taijiro; and Washizu, Fumio, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for production of coated super-hard alloy articles. 4,463,033, Cl. 427-255.300.

Kikuchi, Yoshiki; Ohmori, Takashi; and Moriguchi, Haruhiko, to Fuji Xerox Co., Ltd. Heat transfer recording apparatus. 4,463,360, Cl. 346-76.0PH.

Kilham, Peter. Bird feeder with rotatable cover. 4,462,337, Cl. 119-51.00R.

Kim, Bang M.; and Amodeo, Paul A., Jr., to General Electric Company. Process for treating wastewater containing fat and heavy metal ions. 4,462,913, Cl. 210-708.000.

Kim, Ho K. Solar animal structure. 4,462,334, Cl. 119-16.000.

Kim, Syng N., to Wico Corporation. Pushbutton assembly with integral bias means. 4,463,237, Cl. 200-340.000.

Kimberly-Clark Limited: *See*—
Oubridge, Terence J.; and Boorman, Ben, 4,462,868, Cl. 162-280.000.

Kimura, Kazuhiko: *See*—
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,463,086, Cl. 430-553.000.

Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., to Olin Corporation. Transformer-driven shield for electromagnetic casting. 4,462,457, Cl. 164-503.000.

King Engineering Corporation: *See*—
Boddy, Ronald L., 4,462,258, Cl. 73-706.000.

King Instrument Corporation: *See*—
Goguen, Louis J.; and Woodley, George M., 4,462,858, Cl. 156-506.000.

King, Kevin J.: *See*—
Haylett, Lyle M.; Houck, Robert J.; and King, Kevin J., 4,463,434, Cl. 364-507.000.

King, Roderick V., to Specialty Packaging Products, Inc. Method for threading closures. 4,462,235, Cl. 72-103.000.

Kingsdown Medical Consultants Limited: *See*—
Steer, Peter L.; and Edwards, John V., 4,462,510, Cl. 222-48.000.

Kircaldie, Randall and McNab: *See*—
Durkan, Gerald; and Sieracki, Leonard M., 4,462,398, Cl. 128-200.140.

Kirkland, Johnny P.: *See*—
Kabler, Milton N.; Williams, Richard T.; Rife, Jack C.; Hunter, William R.; Kirkland, Johnny P.; and Lien, Neil C., 4,462,689, Cl. 356-333.000.

Kirschbaum, Herbert S., to Westinghouse Electric Corp. Dual power, constant speed electric motor system. 4,463,302, Cl. 318-754.000.

Kirschbaum, Herbert S., to Westinghouse Electric Corp. Six pole/eight pole single-phase motor. 4,463,303, Cl. 318-776.000.

Kishi, Takao: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,462,549, Cl. 239-333.000.

Kishimoto, Mitsuharu: *See*—
Maeda, Takuya; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Kubotani, Atsuyoshi, 4,462,793, Cl. 432-14.000.

Kisler, Semyon, to Polaroid Corporation. Electrostatic web clamp. 4,462,528, Cl. 226-120.000.

Kisler, Semyon, to Polaroid Corporation. Coating-bead stabilization apparatus. 4,463,040, Cl. 427-445.000.

Kisumi, Masahiko: *See*—
Chibata, Ichiro; Kisumi, Masahiko; Komatsubara, Saburo; and Murata, Kousaku, 4,463,094, Cl. 435-115.000.

Kitagawa, Hiroshi; Onodera, Teruyuki; Fukushima, Toshiyuki; and Hayashi, Yoriyuki, to Osaka Petrochemical Industries Ltd.; and Toyo CCI Kabushiki Kaisha. Method of removing arsenic in hydrocarbons. 4,462,896, Cl. 208-253.000.

Kitahama, Yoshiharu: *See*—
Nogami, Sumitaka; Wakabayashi, Tsuneo; Ono, Eiichi; Kitahama, Yoshiharu; and Iwami, Isamu, 4,463,162, Cl. 528-190.000.

Kitajima, Masao; Seshimoto, Osamu; Namiki, Tomizo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Mizobuchi, Yuzo, to Fuji Photo Film Co., Ltd. Thermal recording elements. 4,463,083, Cl. 430-273.000.

Kitano, Yuichi: *See*—
Tada, Yoshiharu; and Kitano, Yuichi, 4,463,296, Cl. 318-452.000.

Kitsukawa, Kazumi: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,463,112, Cl. 524-109.000.

Kiyofuji, Takahiro: *See*—
Kameyama, Kazuhide; Kiyofuji, Takahiro; and Shigeyama, Yukinori, 4,462,456, Cl. 164-448.000.

Kiyoshima, Kohki: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Tatsuta, Kuniaki; Ishikura, Tomoyuki; Okamoto, Rokuro; Yamamoto, Masao; and Kiyoshima, Kohki, 4,463,171, Cl. 536-7.100.

Kiar, Erhard; Nadkarni, Anil V.; and Samal, Prasanna K., to SCM Corporation. Oxygen-free dispersion-strengthened copper and process for making same. 4,462,845, Cl. 148-13.200.

Klein, Gerald W.: *See*—
Snow, Robert A.; and Klein, Gerald W., 4,463,080, Cl. 430-213.000.

Kleinecke, John D., to Siemens-Allis, Inc. Magnetic circuit for high voltage contactor. 4,463,335, Cl. 337-4.000.

Kleinecke, John D.; Little, Thomas R.; and Farag, Samir F., to Siemens-Allis, Inc. Two-high motor control center with staggered cubicles. 4,463,408, Cl. 361-342.000.

Kleinewefers, Jaeggli AG: *See*—
Packschies, Werner; and Miethe, Gunther, 4,462,228, Cl. 68-22.00R.

Kleywegt, Jacob: *See*—
Goergen, Rene; and Kleywegt, Jacob, 4,462,446, Cl. 152-209.00R.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Eckert, Rolf, 4,462,343, Cl. 123-41.690.

Kmiecik, Joseph C.: *See*—
Olson, John G.; and Kmiecik, Joseph C., 4,462,555, Cl. 242-118.600.

Knab, Rochus: *See*—
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,462,362, Cl. 123-425.000.

Knohl, Rudolph E., to Illinois Tool Works Inc. Painted screw and washer assemblies. 4,462,730, Cl. 411-371.000.

Knoos, Stellan. Unitary heat engine/heat pump system. 4,462,212, Cl. 60-526.000.

Knowles, Richard P., to Lucas Industries Limited. Starting aids for internal combustion engines. 4,462,354, Cl. 123-255.000.

Knurr, Hans. Extruded section bar member. 4,463,057, Cl. 428-595.000.

Kobayashi, Hisao: *See*—
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,462,491, Cl. 192-84.00R.

Kobayashi, Kouichi: *See*—
Nakao, Shinroku; and Kobayashi, Kouichi, 4,462,607, Cl. 280-644.000.

Kobayashi, Masateru: *See*—
Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, 4,463,179, Cl. 548-255.000.

Kobayashi, Nobuyuki; Ito, Hiroshi; and Kuma, Takahide, to Toyota Jidosha Kabushiki Kaisha. Engine idling rotational speed control device. 4,462,360, Cl. 123-339.000.

Kobayashi, Nobuyuki; and Itoh, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control method and apparatus utilizing an exhaust gas concentration sensor. 4,462,374, Cl. 123-489.000.

Kobayashi, Shunichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic electric-energy meter. 4,463,311, Cl. 324-142.000.

Kobayashi, Tadahiko: *See*—
Inomata, Koichiro; Hasegawa, Michio; and Kobayashi, Tadahiko, 4,462,826, Cl. 75-123.00B.

Kobayashi, Yoshinori: *See*—
Samejima, Masayoshi; Hirata, Goichi; Koida, Yoshiyuki; Kobayashi, Yoshinori; and Kida, Akira, 4,462,982, Cl. 424-35.000.

Koch Process Systems, Inc.: *See*—
Holmes, Arthur S.; and Ryan, James M., 4,462,814, Cl. 62-17.000.

Koch, Robert E.; and Stetson, Earl W., to Electric Power Research Institute, Inc. Fail safe surge arrester. 4,463,405, Cl. 361-135.000.

Kochs Adler AG: *See*—
Scholl, Hans, 4,462,320, Cl. 112-104.000.
Kockums Industries, Inc.: *See*—
Allen, William H., 4,462,443, Cl. 144-242.00R.
Kodama, Hisashi, to Ainin Seiki Kabushiki Kaisha. Hydraulic lash adjuster. 4,462,364, Cl. 123-90.550.
Kodama, Hisashi: *See*—
Arai, Fuminso; Kodama, Hisashi; and Okabe, Yoshio, 4,462,353, Cl. 123-198.00F.
Kodama, Toshikazu: *See*—
Suzuki, Hitoshi; and Kodama, Toshikazu, 4,463,327, Cl. 333-194.000.
Koga, Ituo: *See*—
Motosugi, Katsuhiko; and Koga, Ituo, 4,462,349, Cl. 123-188.00M.
Koga, Yoshio; and Inadomi, Takafumi, to Mitsubishi Denki Kabushiki Kaisha. Special effects noise reduction in a rotary head reproduction apparatus. 4,463,390, Cl. 360-10.300.
Kogane, Mikio, to Fuji Photo Film Co., Ltd. Apparatus for regulating the cutting plane of a strip. 4,462,588, Cl. 271-265.000.
Kohjin Co., Ltd.: *See*—
Mizutani, Tomoji; Fukushima, Hitoshi; and Sakamoto, Yoshihiro, 4,463,153, Cl. 526-348.100.
Koida, Yoshiyuki: *See*—
Samejima, Masayoshi; Hirata, Goichi; Koida, Yoshiyuki; Kobayashi, Yoshinori; and Kida, Akira, 4,462,982, Cl. 424-35.000.
Koizumi, Morimasa: *See*—
Nishijima, Masayuki; Koizumi, Morimasa; and Matsuda, Minoru, 4,463,029, Cl. 427-209.000.
Kojima, Gen; and Hisazue, Michio, to Asahi Glass Company Ltd. Process for producing propylene-tetrafluoroethylene copolymer. 4,463,144, Cl. 526-94.000.
Kojima, Yoshio: *See*—
Emi, Shigesori; Kojima, Yoshio; and Ando, Makoto, 4,463,095, Cl. 435-190.000.
Kokusan Denki Co., Ltd.: *See*—
Nanjyo, Hirotoshi: Serizawa, Hiroshi; and Sagae, Michio, 4,462,363, Cl. 123-427.000.
Kollmorgen Technologies Corporation: *See*—
Langley, Lawrence W.; Wedman, Leonard N.; and Jacobson, William D., 4,463,299, Cl. 318-662.000.
Kolowski, Michael A.: *See*—
Siefert, George J.; Kolowski, Michael A.; Lynch, John E.; Ruip, Terrence M.; and Gresens, Henry L., 4,462,447, Cl. 152-353.00C.
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, to Pioneer Electronic Corporation. Tape retaining mechanism. 4,463,394, Cl. 360-96.500.
Komatsubara, Saburo: *See*—
Chibata, Ichiro; Kisumi, Masahiko; Komatsubara, Saburo; and Murata, Kousaku, 4,463,094, Cl. 435-115.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Monma, Masao, 4,462,682, Cl. 355-15.000.
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,463,086, Cl. 430-553.000.
Suzuki, Kiziro; and Takahashi, Yoshiharu, 4,462,671, Cl. 354-430.000.
Tamura, Akihiko; Shukuri, Katsuhiro; Kawamoto, Kiyoaki; and Iwahashi, Haruo, 4,463,284, Cl. 315-158.000.
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Apparatus for controlling a driving force applied to a compressor. 4,462,491, Cl. 192-84.00R.
Konrad, Gunther: *See*—
Moller, Hinrich; Hase, Brigitte; Konrad, Gunther; Wilk, Hans-Christoph; and Zeidler, Ulrich, 4,463,006, Cl. 424-251.000.
Konstant, Anthony N.; and Weider, John J., to Speedrack, Inc. Multiple location storage bays. 4,462,500, Cl. 211-151.000.
Koopman, Nicholas G.: *See*—
Bhattacharya, Somnath; Chance, Dudley A.; Koopman, Nicholas G.; and Ray, Sudipta K., 4,463,059, Cl. 428-620.000.
Korach, Malcolm: *See*—
DeLue, Norman R.; and Korach, Malcolm, 4,462,876, Cl. 204-59.00R.
Koser, Charles W., to T & M Rubber, Inc. Injection sleeve molding machine. 4,462,782, Cl. 425-183.000.
Kosmatka, Walter J.; and Zalar, Frank E., to General Electric Company. Lamp unit having accurately positioned filament. 4,463,278, Cl. 313-318.000.
Kosuge, Tokuo: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,462,378, Cl. 123-571.000.
Kotaka, Yasuyosi: *See*—
Okuhara, Akira; Kotaka, Yasuyosi; Nishio, Masakazu; Sato, Susumu; Watanabe, Isamu; and Inoue, Masaru, 4,463,019, Cl. 426-17.000.
Kothe, Erich: *See*—
Obermann, George; Kothe, Erich; and Redfield, William H., 4,463,225, Cl. 200-35.00R.
Kousmura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, to Canon Kabushiki Kaisha. Ink jet recording apparatus with vacuum platen. 4,463,361, Cl. 346-134.000.
Koutonen, Pauli; and Alanco, Lars-Erik, to Oy Wartsila A.B. Method and means for the identification of a roll. 4,463,251, Cl. 235-470.000.
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, to Biogal Gyogyszergyar. Aminoacridine-α, β-(D)- or -(L)-N-glycoside derivatives, the salts thereof and a process for the preparation of such compounds. 4,462,993, Cl. 424-180.000.
Koyama, Masayasu; Yazaki, Takashi; and Tanikawa, Isao, to Toyo Seikan Kaisha, Ltd. Easily openable liner for vessel closures. 4,463,116, Cl. 524-232.000.
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., to C. Conradty Nurnberg GmbH & Co. KG. Apparatus for fusion electrolysis and electrode therefor. 4,462,887, Cl. 204-286.000.
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., to C. Conradty Nurnberg GmbH & Co. KG. Electrode for fusion electrolysis and electrode therefor. 4,462,888, Cl. 204-286.000.
Kraan, Gerrit: *See*—
Junge, Norbert E. A.; and Kraan, Gerrit, 4,462,536, Cl. 229-5.500.
Kracke, Wilhelm, to Dr. Alois Stankiewicz Schallschluck GmbH & Co. Sound-absorbing wall-lining. 4,463,049, Cl. 428-281.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Mayer, Hans; and Sterk, Zvonimir, 4,462,340, Cl. 122-34.000.
Kramer, Daniel E. Non-freeze drain assembly. 4,462,216, Cl. 62-80.000.
Krapcho, John: *See*—
Petrillo, Edward W., Jr.; Gordon, Eric M.; Krapcho, John; and Sprague, Peter W., 4,462,943, Cl. 260-112.50R.
Krause, Edward. Page marker. 4,462,614, Cl. 281-42.000.
Krause, Gerhard, to Erwin Sick GmbH Optik-Elektronik. Apparatus for spectral analysis of a broad beam of radiation using a dispersive element interposed between two modulators. 4,462,687, Cl. 356-326.000.
Kreighbaum, William E.: *See*—
Dennis, Ronald D.; Dolak, Terence M.; and Kreighbaum, William E., 4,463,176, Cl. 546-208.000.
Krestenyakov, Yordan I.: *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.
Kretchman, Gerald L.: *See*—
Burkall, Alvin E.; and Kretchman, Gerald L., 4,462,170, Cl. 34-82.000.
Krishnan, Sivaram; and Sanderson, John R., to Mobay Chemical Corporation. Polycarbonate from 4,4'-bis (4-hydroxyphenyl thio)biphenyls. 4,463,163, Cl. 528-196.000.
Krivak, Thomas G.: *See*—
Wagner, Melvin P.; Taltz, Joseph P.; and Krivak, Thomas G., 4,463,108, Cl. 523-216.000.
Krout, Donald: *See*—
Sanzone, Salvatore J.; and Krout, Donald, 4,462,116, Cl. 2-170.000.
Kroy Inc.: *See*—
Luartes, Cleto R.; and Powell, William H., Jr., 4,462,708, Cl. 400-304.000.
Kruer, Thomas R.: *See*—
Guess, Joe F.; and Kruer, Thomas R., 4,462,255, Cl. 73-633.000.
Krupp Wilputte Corporation: *See*—
Davis, Rufus F., Jr.; Marting, Donald G.; and Auvil, Harvey S., 4,462,869, Cl. 201-40.000.
Kubis, Charles S.: *See*—
Roth, Donald J.; Kubis, Charles S.; and Walter, John, 4,462,504, Cl. 220-214.000.
Kubota, Ltd.: *See*—
Yoshii, Takashi; Horii, Yasuyuki; and Tama, Tomeaki, 4,462,273, Cl. 74-745.000.
Kubotani, Atsuyoshi: *See*—
Maeda, Takuya; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Kubotani, Atsuyoshi, 4,462,793, Cl. 432-14.000.
Kudlicka, Mark L., to Cranston Machinery Co., Inc. Lift frame assembly. 4,462,627, Cl. 294-81.0SF.
Kugler, Tibor, to Swiss Aluminium Ltd. Cathode for a fused salt electrolytic cell. 4,462,886, Cl. 204-284.000.
Kuma, Takahide: *See*—
Kobayashi, Nobuyuki; Ito, Hiroshi; and Kuma, Takahide, 4,462,360, Cl. 123-339.000.
Kumeda, Yasuo: *See*—
Kajiura, Koichi; Edanami, Kozo; Onoki, Seiji; Izumina, Tatsuya; and Kumeda, Yasuo, 4,463,350, Cl. 340-825.010.
Kunczynski, Jan K. Rocker arm assembly for an aerial tramway. 4,462,314, Cl. 104-115.000.
Kuntz, Emile: *See*—
Chabardes, Pierre; and Kuntz, Emile, 4,463,196, Cl. 568-450.000.
Kuraoka, Yasuo; and Sakao, Nobuo, to Hoxan Corporation. Method of preserving organ and apparatus for preserving the same. 4,462,215, Cl. 62-78.000.
Kurata, Masami; and Inui, Toshiharu, to Fuji Xerox Co., Ltd. Thermal heat driving system. 4,462,704, Cl. 400-120.000.
Kurata, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Lubrication apparatus in internal combustion engine. 4,462,350, Cl. 123-196.0CP.
Kurosu, Tomio; and Yoshikawa, Yukio, to Copal Company Limited. Control circuit for an electromagnetically driven programming shutter. 4,462,672, Cl. 354-435.000.
Kursewicz, Christine H.; and McWilliams, John P., to Mobil Oil Corporation. Aromatics processing. 4,463,209, Cl. 585-467.000.
Kurumada, Katsuhiko: *See*—
Ishii, Yasunobu; Asai, Kazuyoshi; and Kurumada, Katsuhiko, 4,463,366, Cl. 357-22.000.

Kusakabe, Hiromi, to Tokyo Shibaura Denki Kabushiki Kaisha. FM demodulator with regulation of the output D.C. component. 4,463,317, Cl. 329-103.000.

Kusano, Chushirou: *See*—
Shidara, Keiichi; Taninka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.

Kusano, Kazuya: *See*—
Sakata, Gojyo; Numata, Tatsuo; Kusano, Kazuya; Hircse, Masayoshi; and Hirata, Kiminori, 4,462,994, Cl. 424-200.000.

Kushmuk, Walter P., to Continental Scale Corporation. Weighing scale. 4,462,475, Cl. 177-173.000.

Kutzler, John M., to Outboard Marine Corporation. CD power pack tester. 4,463,315, Cl. 324-382.000.

Kuwada, Yutaka: *See*—
Horii, Satoshi; Mizokami, Nariakira; and Kuwada, Yutaka, 4,463,172, Cl. 544-027.000.

Kuwajima, Teruaki; and Matsumura, Akira, to Nippon Paint Co., Ltd. Cathode-depositing electrocoating composition, and production thereof. 4,463,111, Cl. 523-413.000.

Kuwakado, Satosi: *See*—
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,462,379, Cl. 123-569.000.

Kuzara, James H., to Ralston Purina Company. Animal feeding and monitoring system. 4,463,353, Cl. 340-825.540.

Kyster, Erik: *See*—
Thomsen, Svend E.; and Kyster, Erik, 4,462,209, Cl. 60-384.000.

La Telemecanique Electrique: *See*—
Lesous, Jean M.; Lerude, Gerard; and Julien, Claude, 4,463,236, Cl. 200-295.000.

Laarman, Timothy D.: *See*—
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., 4,462,333, Cl. 118-723.000.

LaBate, Micheal D. Ladle covering compound. 4,462,834, Cl. 106-38.280.

LaBianco, Richard A. Wave-reducing baffle for water beds. 4,462,128, Cl. 5-450.000.

Lacko, Robert E.; and Tilbrook, Roger W., to United States of America, Energy. LMFBR fuel assembly design for HCDA fuel dispersal. 4,462,958, Cl. 376-420.000.

Ladney, Michael, Jr.: *See*—
Loren, Norman, 4,462,640, Cl. 301-37.00P.

Ladouceur, Harold A., to Alpha Industries, Inc. Linear accelerator system for axially advancing an elongate workpiece. 4,462,529, Cl. 226-125.000.

Lafeber, Andre ; and Wilson, Frank R., to Imperial Chemical Industries PLC. Closeable threadline guide for suppressing fluid flow. 4,462,229, Cl. 68-212.000.

Lage, Karl-Heinz: *See*—
Bosse, Frank; and Lage, Karl-Heinz, 4,462,431, Cl. 139-13.00R.

Lagios, Peter. Dental articulators. 4,462,801, Cl. 433-60.000.

Lahaussois, Michel: *See*—
Gentric, Alain; and Lahaussois, Michel, 4,463,235, Cl. 200-175.000.

Laing, Karsten. In-line centrifugal pump. 4,462,752, Cl. 415-219.00B.

L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude: *See*—
Roullet, Alain, 4,462,221, Cl. 62-381.000.

Lama, William L., to Xerox Corporation. Imaging system utilizing a gradient index lens array compensated for non-uniform object illumination. 4,462,662, Cl. 350-413.000.

Lance, Mark A. Seat with adjustable back support. 4,462,635, Cl. 297-284.000.

Landgraf, Hermann; and Hain, Josef, to Siemens Aktiengesellschaft. Device for cleaning teeth. 4,462,803, Cl. 433-88.000.

Landis, James P., to Pillar Corporation. Alternating current power supply for highly inductive loads. 4,463,414, Cl. 363-86.000.

Landon, Thomas E.; Secrist, Duane R.; and Clark, James M., to Great Lakes Carbon Corporation. Non-consumable electrode for molten salt electrolysis. 4,462,889, Cl. 204-292.000.

Landsman, Stephen A.: *See*—
Eichler, Jack H.; and Landsman, Stephen A., 4,462,908, Cl. 210-237.000.

Lang, Armin, to Zahnradfabrik Friedrichshafen, AG. Servo steering. 4,462,478, Cl. 180-143.000.

Lang, Gusztav: *See*—
Uhlig, Raimer; and Lang, Gusztav, 4,462,729, Cl. 411-15.000.

Langdon, Glen G., Jr.; and Rissanen, Jorma J., to International Business Machines Corporation. Method and means for carry-over control in the high order to low order pairwise combining of digits of a decodable set of relatively shifted finite number strings. 4,463,342, Cl. 340-347.0DD.

Lange, Jack, to Expandable Van Tops Ltd. Expandable van top tent assembly. 4,462,631, Cl. 296-160.000.

Langley, Lawrence W.; Wedman, Leonard N.; and Jacobson, William D., to Kollmorgen Technologies Corporation. Capacitive sensor motor control system. 4,463,299, Cl. 318-662.000.

Langowski, Faustyn C.; Berry, Joe R.; and Priest, Joseph R., to Hughes Tool Company. Beam type racking system. 4,462,733, Cl. 414-22.000.

Lanier, John H.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,462,318, Cl. 110-238.000.

Lapchynski, Lenard: *See*—
Franko, Lloyd; and Lapchynski, Lenard, 4,462,317, Cl. 109-45.000.

Lapham, Richard G.: *See*—
Antos, John M.; Lapham, Richard G.; Sargent, Charles L.; and Sargent, Frank T., 4,462,124, Cl. 4-346.000.

Larsen, Robert H., to Singer Company, The. Bobbin and plunger assembly. 4,462,324, Cl. 112-279.000.

Larsen, Stephen H.: *See*—
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Oae, Earl E., 4,463,092, Cl. 435-70.000.

Larsen, Theodore E., to Detector Electronics Corp. Method and apparatus for safely controlling explosions in black liquor recovery boilers. 4,462,319, Cl. 110-238.000.

Larson, Fred G., to Pocket Cooler Company. Insulating jacket for a beverage container. 4,462,444, Cl. 150-52.00R.

Larson, Lars G.: *See*—
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Lars G., 4,462,950, Cl. 264-292.000.

Laser Technology, Inc.: *See*—
Newman, John W., 4,462,668, Cl. 354-317.000.

Laude, Lucien D., to L'Etat Belge, Represente par le Secretaire General des Services de la Programmation de la Politique Scientifique. Method for preparing composite or elementary semi-conducting polycrystalline films. 4,463,028, Cl. 427-53.100.

Laufer, Helmut: *See*—
Karle, Anton; and Laufer, Helmut, 4,462,361, Cl. 123-357.000.

Laussermair, Friedrich; and Simon, Michael, to M.A.N Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Radiation receiver. 4,462,391, Cl. 126-432.000.

Lawless, William N. Oxygen sensor and high temperature fuel cells. 4,462,891, Cl. 204-427.000.

Lawrence, John G.: *See*—
McNeight, David L.; and Lawrence, John G., 4,463,230, Cl. 235-385.000.

Lawrence, William; and Gaines, Jack, to Eldon Industries, Inc. Soldering iron having electric heater unit with improved heat transfer characteristics. 4,463,247, Cl. 219-236.000.

Laws, Gerald E., to Texas Instruments Incorporated. Serial/parallel input/output bus for microprocessor system. 4,463,421, Cl. 364-200.000.

Leco Corporation: *See*—
O'Brien, Larry S.; and Kaler, Ward S., 4,462,963, Cl. 422-78.000.

Lederman, Frederick E., to General Motors Corporation. Steerable suspension bearing assembly. 4,462,608, Cl. 280-668.000.

Lee, Hsing C. Apparatus and method for controlling and ordering Chinese characters. 4,462,703, Cl. 400-110.000.

Lee, Nancy M.; Loh, Horace H.; and Chang, Jaw-Kang, to University of California, The Regents of the. Dynorphin amide analogs. 4,462,941, Cl. 260-112.50R.

Lee, Thomas G. Apparatus for field testing a smoke detector. 4,462,244, Cl. 73-1.00G.

Legger, Eligio: *See*—
Legger, Roberto; Amosso, Lorenzo; and Legger, Eligio, 4,462,592, Cl. 273-73.00D.

Legger, Roberto; Amosso, Lorenzo; and Legger, Eligio. Metallic frame for tennis rackets. 4,462,592, Cl. 273-73.00D.

Leiber, Heinz, to Robert Bosch GmbH. Vehicle brake system. 4,462,642, Cl. 303-119.000.

Leiber, Heinz: *See*—
Mohl, Helmut; Schwab, Manfred; Sauer, Joseph; Muller, Alfred; Leiber, Heinz; and Czinczel, Armin, 4,462,275, Cl. 74-866.000.

Leibinger, Berthold: *See*—
Herb, Eugen; and Leibinger, Berthold, 4,462,147, Cl. 29-423.000.

Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi. Phenylethylidene-substituted phenyl polyphosphites. 4,463,112, Cl. 524-109.000.

Leitner, Kajetan. Mounting device for a nut to be provided on a metal plate. 4,462,710, Cl. 403-21.000.

Leland Standford Junior University, The Board of Trustees of the: *See*—
Macovski, Albert, 4,463,375, Cl. 358-111.000.

Leland Stanford Junior University, Board of Trustees of the: *See*—
Shaw, Herbert J.; and Digonnet, Michel J. F., 4,462,699, Cl. 374-131.000.

Lemaignan, Clement, to Commissariat a l'Energie Atomique. Process for producing a crack in a tube. 4,462,260, Cl. 73-799.000.

Lemoine, Jean-Marie: *See*—
Bitaillou, Alex; Masson, Jean; and Lemoine, Jean-Marie, 4,462,534, Cl. 228-180.00A.

Lemoyne, Henri: *See*—
Carles, Jacques; and Lemoyne, Henri, 4,462,864, Cl. 162-56.000.

Lenhart, Ronald A., to Precision Metal Fabricators, Inc. Air table system. 4,462,720, Cl. 406-84.000.

Lenke, Dieter: *See*—
Schlecker, Rainer; Friedrich, Ludwig; and Lenke, Dieter, 4,463,007, Cl. 424-251.000.

Lepain, Andre; and Bronchart, Robert D. E. M., to Cosden Technology, Inc. Oil slick dispersants using diguanidinium salt. 4,462,910, Cl. 210-610.000.

Lerude, Gerard: *See*—
Lesous, Jean M.; Lerude, Gerard; and Julien, Claude, 4,463,236, Cl. 200-295.000.

Les Cables De Lyon: *See*—
Sirel, Michel, 4,463,406, Cl. 361-56.000.

Les Equipments Forestiers SLR Inc.: *See*—
Gaudreault, Pierre, 4,462,438, Cl. 144-2.00Z.

Lesher, George Y.; Opalka, Chester J., Jr.; and Singh, Baldev, to Sterling Drug Inc. 2-Alkoxy-5-(pyridinyl)pyridines and cardiotonic use thereof. 4,463,008, Cl. 424-263.000.

Lesous, Jean M.; Lerude, Gerard; and Julien, Claude, to La Telemecanique Electrique. Electrical apparatus, particularly a relay or a small-size contactor. 4,463,236, Cl. 200-295.000.

L'Etat Belge, Represente par le Secretaire General des Services de la Programmation de la Politique Scientifique: *See—*
Laude, Lucien D., 4,463,028, Cl. 427-53.100.

Lever Brothers Company: *See—*
Boskamp, Jellies V., 4,462,922, Cl. 252-174.120.

Levinson, Lionel M., to General Electric Company. Varistors with controllable voltage versus time response and method for using the same to provide a rectangular voltage pulse. 4,463,268, Cl. 307-106.000.

Levitsky, Viktor K.: *See—*
Erasov, Fedor N.; Levitsky, Viktor K.; and Skripkin, Sergei V., 4,462,773, Cl. 418-61.00B.

Lewis, Arlin C. Solar-wind energy conversion system. 4,462,213, Cl. 60-641.800.

Lewis, Henry G., Jr., to RCA Corporation. Clock generation apparatus for a digital television system. 4,463,371, Cl. 358-13.000.

Lewis, Richard W., to Boeing Company, The. Three axis orientation sensor for an aircraft or the like. 4,462,165, Cl. 33-361.000.

Lewitzke, Craig W.: *See—*
Bambenek, Charles L.; and Lewitzke, Craig W., 4,462,620, Cl. 285-162.000.

Li, Hsin L.: *See—*
Oswald, Hendrikus J.; Li, Hsin L.; and Butler, Russell H., 4,462,143, Cl. 28-257.000.

Lickei, Donald L.: *See—*
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,463,158, Cl. 528-75.000.

Lien, Neil C.: *See—*
Kabler, Milton N.; Williams, Richard T.; Rife, Jack C.; Hunter, William R.; Kirkland, Johnny P.; and Lien, Neil C., 4,462,689, Cl. 356-333.000.

Lin, Shiow C., to W. R. Grace & Co. Reactive plastisol dispersion. 4,463,128, Cl. 525-59.000.

Lincoln Manufacturing Company, Inc.: *See—*
Henke, Mitchell C.; Bell, Gordon D.; Smith, Donald P.; and Archer, Virgil L., 4,462,383, Cl. 126-21.00A.

Linderfelt, Hal R. Apparatus for harvesting wave energy. 4,462,211, Cl. 60-501.000.

Link, Steven G.; and Webster, Frank G., to Eastman Kodak Company. Merocyanine-cyanine-merocyanine (MCM) electrically photosensitive colorants for photoelectrophoretic imaging. 4,463,076, Cl. 430-37.000.

Linssen, Johannus L. J. M.: *See—*
Aerts, Wilhelmus J.; ter Horst, Gerhardus E. R.; and Linssen, Johannus L. J. M., 4,462,681, Cl. 355-14.0SH.

Lippmann, Heinrich: *See—*
Mundus, Friedhelm; and Lippmann, Heinrich, 4,462,857, Cl. 156-361.000.

Lipstein, Norman J.: *See—*
Giles, Walter B.; and Lipstein, Norman J., 4,462,205, Cl. 60-39.020.

Liptak, Andras: *See—*
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.

Little, Thomas R.: *See—*
Kleinecke, John D.; Little, Thomas R.; and Farag, Samir F., 4,463,408, Cl. 361-342.000.

Littlewood, Peter S., to Sandoz Ltd. Stable solutions of optical brighteners. 4,462,925, Cl. 252-301.280.

Litton Industrial Products, Inc.: *See—*
Dunn, Elman R., 4,462,187, Cl. 51-111.00R.
Vollrath, Donald E., 4,463,415, Cl. 363-87.000.

Liu, Huei-Cheng, to Exxon Research & Engineering Co. Process for alkylating toluene with methanol to form styrene using a low sodium content potassium/cesium modified zeolite catalyst composition. 4,463,204, Cl. 585-437.000.

Liu, Ping Y.: *See—*
Tyrell, John A.; Liu, Ping Y.; and Freimiller, Gary L., 4,463,132, Cl. 525-92.000.

Lockhart, Bruce D., to General Motors Corporation. Throttle system. 4,462,357, Cl. 123-336.000.

Lockheed Corporation: *See—*
Cronin, Michael J., 4,462,561, Cl. 244-118.500.
Johnson, George W., 4,462,565, Cl. 248-51.000.

Lockheed Missiles & Space Co., Inc.: *See—*
Meyer, John W.; Bonin, John H.; and Daniel, Arnold D., Jr., 4,462,739, Cl. 414-217.000.

Loeffler, Hans-Peter: *See—*
Seufert, Walter; Loeffler, Hans-Peter; and Adolphi, Heinrich, 4,462,997, Cl. 424-217.000.

Loew, Peter: *See—*
Stingelin, Willy; and Loew, Peter, 4,462,805, Cl. 8-436.000.

Logansport Distributors, Inc.: *See—*
Welsh, Clarke T., 4,462,387, Cl. 126-299.00R.

Loh, Horace H.: *See—*
Lee, Nancy M.; Loh, Horace H.; and Chang, Jaw-Kang, 4,462,941, Cl. 260-112.50R.

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Walter, Heinz-Peter; and Hahn, Horst, 4,462,723, Cl. 407-18.000.

Lonergan, Dennis A., to Purdue Research Foundation. Isolation of native casein by cryodestabilization. 4,462,932, Cl. 260-119.000.

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Rastilainen, Juhani; and Saarela, Esko, 4,462,744, Cl. 414-311.000.

Lopez, Hugo A.: *See—*
Fritsch, Kenneth L.; Jordan, William A.; and Lopez, Hugo A., 4,463,075, Cl. 430-23.000.

Lor-Al Corporation: *See—*
Tyler, Loren E., 4,462,550, Cl. 239-655.000.

L'Oreal: *See—*
Guert, Jean-Louis H., 4,462,393, Cl. 128-62.00R.

Loren, Norman, to Ladney, Michael, Jr. Plastic simulated wire wheel cover. 4,462,640, Cl. 301-37.00P.

Lorenz, Joachim: *See—*
Grade, Reinhardt; and Lorenz, Joachim, 4,462,820, Cl. 71-67.000.

Louis, Paul R.: *See—*
Ahr, Nicholas A.; Louis, Paul R.; Mullane, William I., Jr.; and Ouellette, William R., 4,463,045, Cl. 428-131.000.

Lourenco, Antonio. Sprinkler device. 4,462,545, Cl. 239-97.000.

Lovisolo, Pier P.: *See—*
Melloni, Piero; Salvadori, Paolo; and Lovisolo, Pier P., 4,463,001, Cl. 424-246.000.

Lowther, Frank E., to Atlantic Richfield Company. Thermoelectric generator apparatus and operation method. 4,463,214, Cl. 136-208.000.

LSE Corp.: *See—*
Blais, Maurice R.; and Hess, Craig N., 4,462,410, Cl. 128-727.000.

Luzaron Metals Ltd.: *See—*
Cytra, Viktor, 4,462,740, Cl. 414-220.000.

Luartes, Cleto R.; and Powell, William H., Jr., to Kroy Inc. Automated tape lettering machine. 4,462,708, Cl. 400-304.000.

Lucas Industries Limited: *See—*
Jarrett, Boaz A., 4,462,370, Cl. 123-450.000.
Knowles, Richard P., 4,462,354, Cl. 123-255.000.
Tumber, Brian W., 4,462,371, Cl. 123-450.000.

Lucht, Hartmut; and Monch, Carl-Wilhelm, to Akademie der Wissenschaftler der DDR. Time dispersion sensor tube. 4,463,253, Cl. 250-213.0VT.

Ludecke, Otto A.: *See—*
Bly, Kenneth B.; Stark, Terrance L.; and Ludecke, Otto A., 4,462,812, Cl. 55-502.000.

Ludens, James H.: *See—*
Collins, Robert J.; Kaplan, Lester J.; Ludens, James H.; and Von Voigtlander, Philip F., 4,463,013, Cl. 424-274.000.

Ludwig, Walter: *See—*
Arndt, Peter J.; Siol, Werner; Ludwig, Walter; and Wenzel, Franz, 4,463,032, Cl. 427-222.000.

Luenser, Werner R.; and Ostrowsky, Efrem M., to Ethyl Molded Products Company. Threaded closure with liner. 4,462,502, Cl. 215-329.000.

Lundberg, Robert D., to Exxon Research and Engineering Co. Polycaprolactone polymers. 4,463,168, Cl. 528-355.000.

Lunsford, Carl D.; and Chen, Ying-Ho, to A. H. Robins Company, Inc. 1-Aryloxy-4-amino-2-butanols. 4,463,190, Cl. 564-349.000.

Lunt, Reginald F. J.: *See—*
Gieson, Clarence L.; Marsh, Randy J.; and Lunt, Reginald F. J., 4,462,585, Cl. 271-11.000.

Lutzke, Werner: *See—*
Kauferle, Josef, deceased; and Lutzke, Werner, 4,462,237, Cl. 72-324.000.

Lynch, John E.: *See—*
Siefert, George J.; Kolowski, Michael A.; Lynch, John E.; Ruip, Terrence M.; and Gresens, Henry L., 4,462,447, Cl. 152-353.00C.

Lynch, Thomas J.; and Pigman, John H., to International Design Corporation. Variable angle straight edge. 4,462,168, Cl. 33-492.000.

M.A.N Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Laussermair, Friedrich; and Simon, Michael, 4,462,391, Cl. 126-432.000.

M. L. Shelley & Partners Limited: *See—*
Perryman, Leslie M., 4,462,786, Cl. 425-388.000.

M. S. Willett, Inc.: *See—*
Walters, Harry J.; and Gerben, Ralph D., 4,462,738, Cl. 414-127.000.

Maag Gear Wheel & Machine Company Limited: *See—*
Haupt, Fritz, 4,462,770, Cl. 418-39.000.

MAC Valves, Inc.: *See—*
Neff, James A., 4,462,427, Cl. 137-625.640.

MacDoran, Peter F., to United States of America, National Aeronautics and Space Administration. Method and apparatus for calibrating the ionosphere and application to surveillance of geophysical events. 4,463,357, Cl. 343-460.000.

Machines Chambon: *See—*
Armelin, Georges E., 4,462,311, Cl. 101-143.000.

Mack Trucks, Inc.: *See—*
Stieg, Robert W., 4,462,271, Cl. 74-711.000.

MacKay, George L.: *See—*
Wenstrom, Roger A.; Irvin, Donald E.; MacKay, George L.; and Robinson, Hugh A., 4,462,854, Cl. 156-250.000.

MacLaughlin, Donald; and Fortuna, Vincent, to Cosden Technology, Inc. Method of oscillatory bonding. 4,462,849, Cl. 156-73.500.

MacLeod, Donald I. Hydraulic pump jack. 4,462,763, Cl. 417-378.000.

Macovski, Albert, to Leland Standford Junior University, The Board of Trustees of the. Multiple-measurement noise-reducing system. 4,463,375, Cl. 358-111.000.

Maddak, Inc.: *See—*
Broeils, John, 4,462,122, Cl. 4-239.000.

Maeda, Kouzo, to Nissan Motor Co., Limited. Door stop arrangement for a vehicle. 4,462,633, Cl. 296-188.000.

Maeda, Takuya; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Kubotani, Atsuyoshi, to Kawasaki Jukogyo Kabushiki Kaisha. Rotary kiln and method of using such a kiln. 4,462,793, Cl. 432-14.000.

Magerlein, Helmut: *See*—
Kersten, Hilde; and Magerlein, Helmut, 4,463,157, Cl. 528-68.000.

Magnetic Peripherals, Inc.: *See*—
Hradel, Anna M., 4,462,742, Cl. 414-280.000.

Maguire, Philip L.: *See*—
Hays, Byron G.; and Maguire, Philip L., 4,462,833, Cl. 106-23.000.

Mahoney, John F.; and Perel, Julius. High field surface ionization process and apparatus for purifying metal and semiconductor materials. 4,462,806, Cl. 23-293.00R.

Maida, Osamu, to Nippon Kogaku K.K. Light measuring apparatus for camera. 4,462,670, Cl. 354-425.000.

Makita Electric Works, Ltd.: *See*—
Fushiya, Fusao; and Inoue, Nobuhiro, 4,462,381, Cl. 125-4.000.

Malin, Michael J., to Technicon Instruments Corporation. Heat stable, polymer-forming composition. 4,463,117, Cl. 524-260.000.

Mall, Gunther; and Wunstel, Eugen, to Pfaff Industriemaschinen GmbH. Sewing mechanism comprising a drag clamp assembly for holding fabric ply ends. 4,462,321, Cl. 112-121.150.

Mallet, Bernard, to Nadella. Endless chain conveyor. 4,462,524, Cl. 198-845.000.

Maly, Neil A., to Goodyear Tire & Rubber Company, The. Process for the functionalization of polystyrene resins. 4,463,135, Cl. 525-123.000.

Manning, Harold E., to Petro-Tex Chemical Corporation. Process for oligomerization of C_2 to C_{10} normal olefins. 4,463,211, Cl. 585-510.000.

Mann's Wine Co., Ltd.: *See*—
Nishizawa, Yoshihiko; Takezawa, Taihei; and Shinohara, Takashi, 4,463,024, Cl. 426-533.000.

Mar Industries, Inc.: *See*—
Castellanos, Juan D.; Cardenas, Enrique C.; Kelly, Max B.; Kelly, Lorenzo J.; and Glicken, Irving, 4,462,879, Cl. 204-140.000.

Marburger, Fritz, to Gunther & Co. Fluted tap. 4,462,727, Cl. 408-220.000.

Margulies, Herman, to Sterling Drug Inc. Dispensing closure for closing a canister containing dispensable articles. 4,462,507, Cl. 221-63.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Polyarylates exhibiting improved heat resistance. 4,463,160, Cl. 528-176.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Polyarylate compositions. 4,463,161, Cl. 528-176.000.

Markson, Morley, to Yorkvest Limited. Footstool. 4,462,636, Cl. 297-439.000.

Marney, O. Guy, Jr.: *See*—
Warmack, Ralph E.; Marney, O. Guy, Jr.; Gallagher, John N.; and Passmore, Paul R., 4,463,451, Cl. 367-16.000.

Mars, Inc.: *See*—
Dean, Robert; and Raphael, Paul S., 4,462,513, Cl. 194-100.00A.

Marsh, Randy J.: *See*—
Gieson, Clarence L.; Marsh, Randy J.; and Lunt, Reginald F. J., 4,462,585, Cl. 271-11.000.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Uclaf, Roussel. Cyclopropane carboxylates. 4,463,014, Cl. 424-275.000.

Marti, Hans-Rudolf; and Gnehm, Rene , to Siegfried Aktiengesellschaft. Process for producing o-nitrobenzaldehyde. 4,463,195, Cl. 568-424.000.

Martin, Fred E. Method and apparatus for constructing multi-storied concrete buildings. 4,462,951, Cl. 264-334.000.

Martin, James F.: *See*—
Carbeau, Richard W.; Martin, James F.; Lanier, John H.; and Holt, William L., 4,462,318, Cl. 110-238.000.

Martin, Lawrence L.; Worm, Manfred; and Crichlow, Charles A., to Hoechst-Roussel Pharmaceuticals, Incorporated. Process for preparing 4-phenyl-1,3-benzodiazepines. 4,462,933, Cl. 260-239.0BD.

Martin, Werner, to Vernitron Corporation. Single action forceps for bone surgery. 4,462,403, Cl. 128-312.000.

Marting, Donald G.: *See*—
Davis, Rufus F., Jr.; Marting, Donald G.; and Auvil, Harvey S., 4,462,869, Cl. 201-40.000.

Maschinenfabrik Augsburg-Nurnberg: *See*—
Schmidt, Werner; and Watzek, Gerhard, 4,462,127, Cl. 5-118.000.

Mase, Noriaki: *See*—
Fukui, Yutaka; Tobita, Yoshimitsu; Hataya, Fumio; Watanabe, Mitsuhiro; and Mase, Noriaki, 4,462,957, Cl. 376-327.000.

Maskasky, Joe E., to Eastman Kodak Company. Controlled site epitaxial sensitization of limited iodide silver halide emulsions. 4,463,087, Cl. 430-567.000.

Massachusetts Institute of Technology: *See*—
Hegedus, Louis; Vayenas, Costas G.; and Michaels, James N., 4,463,065, Cl. 429-33.000.
Horwitz, Christopher M., 4,462,882, Cl. 204-192.00E.

Massey, Michael L.: *See*—
Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., 4,462,904, Cl. 210-177.000.

Masson, Jean: *See*—
Bitaillou, Alex; Masson, Jean; and Lemoine, Jean-Marie, 4,462,534, Cl. 228-180.00A.

Masterweaver (1982) Ltd.: *See*—
Sajo, Geza J.; and Sajo, Agnes, 4,462,432, Cl. 139-33.000.

Mastro, James R., to International Harvester Co. Tractor bogie suspension with steering and weight transfer control. 4,462,477, Cl. 180-24.020.

Masugi, Takashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,462,999, Cl. 424-246.000.

Masumura, Tadahiro: *See*—
Kawakami, Ryusi; and Masumura, Tadahiro, 4,462,336, Cl. 119-20.000.

Material Control, Inc.: *See*—
Kerr, James F., 4,462,523, Cl. 198-810.000.

Matherly, David R.; and Sue, Horace O., to Square D Company. Circuit for intrinsically safe pilot light. 4,463,399, Cl. 361-1.000.

Matoba, Kazuo: *See*—
Touda, Masayuki; Akimune, Yoshio; and Matoba, Kazuo, 4,462,890, Cl. 204-425.000.

Matschke, Arthur L., to Baudex Corp. Stackable dot matrix printing cartridge modules. 4,462,706, Cl. 400-124.000.

Matsuda, Minoru: *See*—
Nishijima, Masayuki; Koizumi, Morimasa; and Matsuda, Minoru, 4,463,029, Cl. 427-209.000.

Matsui, Noboru: *See*—
Suzuki, Toshihiko; and Matsui, Noboru, 4,462,930, Cl. 252-519.000.

Matsumoto, Hiroshi: *See*—
Ogata, Masaru; Tawara, Katsuya; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Takahashi, Toshio, 4,463,011, Cl. 424-273.00R.

Matsumura, Akira: *See*—
Kuwajima, Teruaki; and Matsumura, Akira, 4,463,111, Cl. 523-413.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, 4,462,750, Cl. 415-54.000.

Matsushita Electric Works, Ltd.: *See*—
Nakamura, Yoshimitsu, 4,463,276, Cl. 310-266.000.

Matsuura, Kazuo; and Ohshima, Keisuke, to Toray Industries, Inc. Electrophotographic photosensitive material comprises pyrazoline and hydrazone derivatives. 4,463,077, Cl. 430-56.000.

Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., to Optical Coating Laboratory, Inc. Flexible selective energy control sheet and assembly using the same. 4,463,047, Cl. 428-216.000.

Matthew, John B., to Beloit Corporation. Centrifugal pulp screening device and method. 4,462,900, Cl. 209-243.000.

Matthews, Peter H. D.; and Morecroft, Derek W., to Shell Oil Company. Lubricating oil composition. 4,462,918, Cl. 252-32.70E.

Mattson, Richard L.; and Rodriguez-Rosell, Juan A., to International Business Machines Corporation. Method for dynamically allocating LRU/MRU managed memory among concurrent sequential processes. 4,463,424, Cl. 364-300.000.

Matukura, Yoshiharu: *See*—
Noda, Etsunosuke; Matukura, Yoshiharu; and Nagai, Akihiro, 4,462,996, Cl. 424-243.000.

Matumoto, Takashi: *See*—
Fujimoto, Mitsuru; Imai, Hisashi; and Matumoto, Takashi, 4,462,776, Cl. 425-31.000.

Maul Technology Corporation: *See*—
Parkell, Edward; and Tamagni, Albert J., 4,462,519, Cl. 198-490.000.

Maule, Warren E. Display stand. 4,462,497, Cl. 211-7.000.

Maurer, John J.: *See*—
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, 4,463,151, Cl. 526-307.500.
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, 4,463,152, Cl. 526-307.500.

May, Ronald L.; and Sinclair, Bobby W., to Sappsucker, Inc. System and method for converting wellhead gas to liquefied petroleum gases (LPG). 4,462,813, Cl. 62-17.000.

Mayer, Hans; and Sterk, Zvonimir, to Kraftwerk Union Aktiengesellschaft. Arrangement for preventing the formation of cracks on the inside surfaces of feedwater line nozzles opening into pressure vessels. 4,462,340, Cl. 122-34.000.

Mayne, David W.; and Jennings, Alan K., to Printronix, Inc. Linear motor digital servo control. 4,463,300, Cl. 318-687.000.

Maytag Company, The: *See*—
Noe, William J., 4,462,225, Cl. 68-3.00R.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Dispersion process for preparing thermoplastic resin fiber. 4,462,948, Cl. 264-140.000.

McClean, June L., to Shipley Company Inc. Etchant with increased etch rate. 4,462,861, Cl. 156-640.000.

McCorkle, Kenneth C.; Wells, Horace M.; Scrimshire, Hershell D.; and Beckwith, Robert N., to Early California Foods, Inc. Method for producing black ripe olives. 4,463,023, Cl. 426-270.000.

McCrory, William M., to United States of America, Navy. Inflatable bottom construction for inflatable boat. 4,462,331, Cl. 114-345.000.

McDaniel, Kenneth G.: *See*—
Duranleau, Roger G.; and McDaniel, Kenneth G., 4,463,192, Cl. 564-467.000.

McFarland, Wayne F.: *See*—
Zurcher, Allen K.; and McFarland, Wayne F., 4,462,713, Cl. 405-36.000.

McFaull, Albert J.: *See*—
Grandzol, Richard J.; McFaull, Albert J.; Wanger, W. Hunter; and Rabinovic, I. Samuel, 4,463,131, Cl. 525-76.000.

McGaffigan, Thomas H., to Raychem Corporation. Reusable heat-recoverable connecting device. 4,462,651, Cl. 339-30.000.

McGarry, Sheldon: *See*—
Keenan, William M.; McGarry, Sheldon; and Bassett, James G., Jr., 4,462,574, Cl. 266-45.000.

McGary, Charles W., Jr.; Pascarella, Vincent J.; Rhodes, Delmer R.; and Taller, Robert A., to Warner-Lambert Co., Inc. Polyurethane elastomer and an improved hypoallergenic polyurethane flexible glove prepared therefrom. 4,463,156, Cl. 528-65.000.

McGeehee, Ronald W., to All American University, Incorporated. Oil well pump shutdown system. 4,462,759, Cl. 417-46.000.

McGill Manufacturing Company, Inc.: *See*—
Osika, Thomas F., 4,463,228, Cl. 200-51.00R.

McGinley, Emanuel J.; and Tuason, Domingo C., Jr., to FMC Corporation. Enteric coating for pharmaceutical dosage forms. 4,462,839, Cl. 106-198.000.

McIntyre, Robert J.; and Webb, Paul P., to RCA, Inc. Silicon avalanche photodiode with low k_{eff}. 4,463,368, Cl. 357-30.000.

McKay, Michael L.: *See*—
Sarich, Tony R.; Johnsen, Kenneth N.; and McKay, Michael L., 4,462,760, Cl. 417-54.000.

McKinley, John R.; and Roeschlaub, John G., to Occidental Research Corporation. Process and apparatus for the separation of particles into three fractions of similar compositions. 4,462,495, Cl. 209-3.300.

McKinney, Maurice E., to Boeing Company, The. Composite panel of varied thickness. 4,463,044, Cl. 428-107.000.

McLaughlin, Homer C.; Weaver, Jimmie D., Jr.; and Hall, Bobby E., to Halliburton Company. Oil well treating method and composition. 4,462,718, Cl. 405-264.000.

McMurtry, David R., to Rolls-Royce Limited; and Renishaw Electrical Limited. Probe for measuring workpieces. 4,462,162, Cl. 33-174.00L.

McNeight, David L.; and Lawrence, John G. Method and apparatus for use against counterfeiting. 4,463,250, Cl. 235-385.000.

McNeil, John, to Weldtronic Limited. Plasma cutting and welding torches with improved nozzle electrode cooling. 4,463,245, Cl. 219-121.0PM.

McNulty, Nelson E.: *See*—
Frick, Ralph E.; and McNulty, Nelson E., 4,463,339, Cl. 340-906.000.

McWilliams, John P.: *See*—
Kursewicz, Christine H.; and McWilliams, John P., 4,463,209, Cl. 585-467.000.

Mead Johnson & Company: *See*—
Dennis, Ronald D.; Dolak, Terence M.; and Kreighbaum, William E., 4,463,176, Cl. 546-208.000.

Meagher, Ralph E.; and Ostergren, Carl D., to International Business Machines Corporation. Thermal conduction piston for semiconductor packages. 4,462,462, Cl. 165-80.00C.

Mecilec: *See*—
Guillemot, Philippe, 4,463,343, Cl. 340-347.0AD.

Medford, Richard D.; and Cooper, Jerry W., to Dayco Corporation. Hose construction and method of making same. 4,462,649, Cl. 339-16.00R.

Mehus, Richard J., to Economics Laboratory, Inc. Backflushing system. 4,462,425, Cl. 137-624.180.

Melfi, Anna J.: *See*—
Melfi, Samuel T.; and Melfi, Nicholas J., 4,462,573, Cl. 256-65.000.

Melfi, Nicholas J.: *See*—
Melfi, Samuel T.; and Melfi, Nicholas J., 4,462,573, Cl. 256-65.000.

Melfi, Samuel T.; and Melfi, Nicholas J., to Melfi, Samuel T.; Melfi, Anna J.; and Melfi, Nicholas J., a part interest. Support post for temporary guard-rail chains. 4,462,573, Cl. 256-65.000.

Melloni, Piero; Salvadori, Paolo; and Lovisolo, Pier P., to Farmitalia Carlo Erba S.p.A. 6-Substituted 6H-dibenzo[b,d]pyran derivatives and process for their preparation. 4,463,001, Cl. 424-246.000.

Merck & Co., Inc.: *See*—
Cragoe, Edward J., Jr.; and Bourke, Robert S., 4,463,208, Cl. 562-462.000.

Merjan, Stanley. Pile driving. 4,462,716, Cl. 405-233.000.

Merkel, Heinrich: *See*—
Andres, Johannes; Hasenkamp, Rainer; and Merkel, Heinrich, 4,462,838, Cl. 106-139.000.

Messens, Joseph L.; Ville, Frans J.; and Beels, Roland F., to AGFA-Gevaert N.V. Method and apparatus for determining the dynamic surface potential of a solution. 4,463,316, Cl. 324-447.000.

Messer Griesheim GmbH: *See*—
Halbauer, Klaus, 4,463,298, Cl. 318-662.000.

Messerschmitt, Elmar K. Process and device for the treatment of screen print fabric. 4,462,174, Cl. 38-102.100.

Messina, Charles J., to United States Steel Corporation. Method for increasing the scrap melting capability of metal refining processes. 4,462,825, Cl. 75-60.000.

Metex Corporation: *See*—
Usher, Peter P.; and Gavaletz, Eugene J., 4,462,603, Cl. 277-230.000.

Metromail Corporation: *See*—
Gieson, Clarence L.; Marsh, Randy J.; and Lunt, Reginald F. J., 4,462,585, Cl. 271-11.000.

Metz, Mac L., to Baltimore Paint & Chemical Co., a division of Dutch Boy, Inc. Method of applying marking lines to a road surface. 4,462,547, Cl. 239-130.000.

Meyer, Bruno, to Valutec AG. Size-adjustable erecting wheelchair. 4,462,604, Cl. 280-242.0WC.

Meyer-Ebrecht, Dietrich; and Christiansen, Jens H., to U.S. Philips Corporation. Arrangement for storing or transmitting and for recovering picture signals. 4,463,377, Cl. 358-133.000.

Meyer, John W.; Ilonin, John H.; and Daniel, Arnold D., Jr., to Lockheed Missiles & Space Co., Inc. Dry pulverized solid material pump. 4,462,739, Cl. 414-217.000.

Meyer, Paul, to Frenkel C-D Aktiengesellschaft. Screw extruders. 4,462,692, Cl. 366-89.000.

Michaels, James N.: *See*—
Hegedus, Louis; Vayenas, Costas G.; and Michaels, James N., 4,463,065, Cl. 429-33.000.

Michigan Technological University: *See*—
Hellawell, Angus, 4,462,454, Cl. 164-133.000.

Michno, Drake M., to Eastman Kodak Company. 4-Hydroxyalkyl-substituted 3-pyrazolidinone electron transfer agents. 4,463,081, Cl. 430-218.000.

Micro Component Technology, Inc.: *See*—
Amundson, Arlon J.; Wurscher, Robert J.; and Buesing, Jonathan P., 4,462,796, Cl. 432-58.000.

Midian Electronics, Inc.: *See*—
Soulliard, Charles; Ward, Herschel W.; Gass, Arthur D.; and Hudor, Andrew M., Jr., 4,463,221, Cl. 179-2.0EB.

Midrex Corporation: *See*—
Dumont, Kenneth R.; and Robinson, Jack R., 4,462,526, Cl. 225-4.000.

Miethe, Gunther: *See*—
Packschies, Werner; and Miethe, Gunther, 4,462,228, Cl. 68-22.00R.

Miettunen, Robert E.; and Shaner, Kenneth H., to GTE Products Corporation. Photochemically machined cutting wheel. 4,462,724, Cl. 407-30.000.

Migliore-Samour, Daniele: *See*—
Jolles, Pierre; and Migliore-Samour, Daniele, 4,462,990, Cl. 424-177.000.

Mikami, Atsutoshi, to Toppan Printing Co., Ltd. Previewing apparatus of flats. 4,463,373, Cl. 358-76.000.

Miki, Nobuaki; and Yokoyama, Shoji. Hydraulic regulator for a V-belt type continuously variable transmission for vehicles. 4,462,277, Cl. 74-867.000.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Ishida, Takashi; and Tominari, Noboru, 4,462,358, Cl. 123-337.000.

Milenkov, Russi T.: *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.

Miller, Granville G.: *See*—
Shacklette, Lawrence W.; Miller, Granville G.; and Frommer, Jane E., 4,462,929, Cl. 252-518.000.

Miller, Jeffrey T., to Standard Oil Company (Indiana). Hydrotreatment process. 4,462,897, Cl. 208-254.00H.

Miller, John D.: *See*—
Bordeaux, John J.; and Miller, John D., 4,462,474, Cl. 177-48.000.

Miller, Matthew S., to General Electric Company. Rotating slot antenna arrangement for microwave oven. 4,463,239, Cl. 219-10.55F.

Miller, Melvin E.: *See*—
Johnston, Edward; Jacobs, Morton; Miller, Melvin E.; and Kaucic, Robert A., 4,462,535, Cl. 228-184.000.

Miller, Thomas A., to Franklin Electric Co., Inc. High voltage motor control circuit. 4,463,304, Cl. 318-790.000.

Milliken Research Corporation: *See*—
Warner, Charles E., 4,462,557, Cl. 242-150.00M.

Mills, J. T., to Sentinel Manufacturing Co., Inc. Engine protective device responsive to low oil pressure. 4,462,352, Cl. 123-198.0DB.

Miloscia, William J.: *See*—
Bodolus, Christopher L.; and Miloscia, William J., 4,463,137, Cl. 525-316.000.

Minagawa, Motonobu: *See*—
Leistner, William E.; Minagawa, Motonobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,463,112, Cl. 524-109.000.

Mineki, Eiji: *See*—
Kawaguchi, Yasuyoshi; Aoyama, Hideki; and Mineki, Eiji, 4,462,448, Cl. 152-354.00R.

Mineyama, Takitsugu: *See*—
Nishiura, Yoshikazu; Mineyama, Takitsugu; and Inoue, Kazuo, 4,463,440, Cl. 364-900.000.

Minnesota Mining and Manufacturing Company: *See*—
Balchunis, Robert J.; and Sher, Frank T., 4,463,114, Cl. 524-157.000.
Braun, David L., 4,462,399, Cl. 128-201.250.
Burgio, Paul A., 4,462,401, Cl. 128-303.00R.
Burgio, Paul A.; Jones, Derrick A.; and Abel, Allen J., 4,462,402, Cl. 128-303.00R.
Dunshee, Wayne K.; and Chang, Robert W. H., 4,462,224, Cl. 62-530.000.

Minolta Camera Kabushiki Kaisha: *See*—
Fujii, Akira; and Beppu, Norio, 4,462,667, Cl. 354-137.000.

Minowa, Ryohei: *See*—
Sugimoto, Shigeo; Minowa, Ryohei; and Sakai, Kozi, 4,462,222, Cl. 62-476.000.

Mintz, Leon: *See*—
Block, Charles; and Mintz, Leon, 4,462,530, Cl. 226-156.000.

Mistral Windsurfing AG of Grindelstrasse: *See*—
Pertramer, Siegfried; Adamek, Joachim; and Prade, Ernstfried, 4,462,327, Cl. 114-90.000.

Mitani, Masao: *See*—
Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki: Kawanabe, Takao; and Tanabe, Isao, 4,463,073, Cl. 430-5.000.

Mitani, Shigeto. Vise with changeable gripping elements. 4,462,581, Cl. 269-283.000.

Mitchell, Mark E., to Figgie International Inc. Inflatable padded game ball. 4,462,590, Cl. 273-65.00E.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Azuma, Kenkoku; Kajita, Isao; and Usui, Akaru, 4,462,965, Cl. 422-186.080.
Hashimoto, Yasuhiko, 4,462,304, Cl. 98-40.00V.
Kanno, Yoshiaki, 4,462,373, Cl. 123-489.000.
Koga, Yoshio; and Inadomi, Takafumi, 4,463,390, Cl. 360-10.300.
Okamoto, Kouichi; Oishi, Norio; Sakuyama, Masaki; Nomura, Tatsuei; Yamada, Tadatoshi; and Iwamoto, Masatami, 4,462,152, Cl. 29-598.000.
Oohashi, Yutaka, 4,463,224, Cl. 200-19.0DC.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Watanabe, Teishiro; Tsunoi, Makoto; Kai, Toshio; Shiota, Hiroshi; Nakabayashi, Hiroshi; Tsutsumi, Tadayoshi; and Sakai, Ryuichi, 4,462,777, Cl. 425-87.000.

Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Kikuchi, Noribumi; Suzuki, Yasuo; Onishi, Taijiro; and Washizu, Fumio, 4,463,033, Cl. 427-255.300.
Miyakawa, Yukiei, 4,462,841, Cl. 148-431.000.

Mitsubishi Oil Company, Ltd.: *See*—
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,893, Cl. 208-40.000.
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,894, Cl. 208-40.000.

Mitsui, Akio; and Morigaki, Masakazu, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,463,085, Cl. 430-372.000.

Mitsumori, Ken'ichi; and Aikawa, Kazuo, to Alps Electric Co., Ltd. Method of fabricating a circuit board and circuit board provided thereby. 4,463,084, Cl. 430-315.000.

Miyagawa, Eiji: *See*—
Harada, Takahiro; Miyagawa, Eiji; Umemoto, Junko; Yoshida, Tsutomu; and Hamakado, Toshinari, 4,463,091, Cl. 435-68.000.

Miyakawa, Yukiei, to Mitsubishi Kinzoku Kabushiki Kaisha. Silver-metal oxide alloy electrical contact materials. 4,462,841, Cl. 148-431.000.

Miyata, Jiro: *See*—
Kawasaki, Katsuyoshi; and Miyata, Jiro, 4,462,481, Cl. 180-215.000.

Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki; Kawanabe, Takao; and Tanabe, Isao, to Hitachi, Ltd. Method and apparatus for redressing defective photomask. 4,463,073, Cl. 430-5.000.

Miyazaki, Toshimasa: *See*—
Asakawa, Kazuo; and Miyazaki, Toshimasa, 4,463,290, Cl. 318-135.000.

Mizobuchi, Yuzo: *See*—
Kitajima, Masao; Seshimoto, Osamu; Namiki, Tomizo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Mizobuchi, Yuzo, 4,463,083, Cl. 430-273.000.

Mizokami, Nariakira: *See*—
Horii, Satoshi; Mizokami, Nariakira; and Kuwada, Yutaka, 4,463,172, Cl. 544-027.000.

Mizukoshi, Katsuro: *See*—
Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki; Kawanabe, Takao; and Tanabe, Isao, 4,463,073, Cl. 430-5.000.

Mizuno, Mitsuo; Suginaka, Akinori; Fujii, Masahiko; and Akimoto, Shinichi, to Nippon Oil and Fats Company, Ltd. Suppository base composition. 4,462,984, Cl. 424-78.000.

Mizutani, Seiki: *See*—
Hayashi, Mikio; and Mizutani, Seiki, 4,462,705, Cl. 400-121.000.

Mizutani, Tomoji; Fukushima, Hitoshi; and Sakamoto, Yoshihiro, to Kohjin Co., Ltd. Heat shrinkable film and process for preparing the same. 4,463,153, Cl. 526-348.100.

Mobay Chemical Corporation: *See*—
Krishnan, Sivaram; and Sanderson, John R., 4,463,163, Cl. 528-196.000.

Mobil Oil Corporation: *See*—
Dion, Eric P., 4,463,256, Cl. 250-256.000.
Dwyer, Francis G.; and Garwood, William E., 4,463,101, Cl. 502-74.000.
Huggard, Mark T., 4,462,947, Cl. 264-54.000.
Kaminski, Joan M.; and Horodysky, Andrew G., 4,462,809, Cl. 44-67.000.
Kursewicz, Christine H.; and McWilliams, John P., 4,463,209, Cl. 585-467.000.
Schick, John W.; and Gemmill, Robert M., Jr., 4,463,201, Cl. 585-10.000.

Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, to Nissan Motor Company, Ltd. Electronic lock system with audible entry monitor. 4,463,349, Cl. 340-825.320.

Mocquet, Gisele C.: *See*—
Guerret, Patrick G.; Bucher, Bernard P.; Dostert, Philippe L.; Mocquet, Gisele C.; and Nedelec, Alain L., 4,463,004, Cl. 424-248.500.

Moffett, Mark B., to United States of America, Navy. Lightweight, broadband Rayleigh wave transducer. 4,462,256, Cl. 73-642.000.

Mohl, Helmut; Schwab, Manfred; Sauer, Joseph; Muller, Alfred; Leiber, Heinz; and Czinczel, Armin, to Robert Bosch GmbH. Electronic control for a stepless vehicle transmission using a control member responsive to static pressure. 4,462,275, Cl. 74-866.000.

Moller, Hinrich; Hase, Brigitte; Konrad, Gunther; Wilk, Hans-Christoph; and Zeidler, Ulrich, to Henkel Kommanditgesellschaft auf Aktien. Diglycidyl-pteridine compounds. 4,463,006, Cl. 424-251.000.

Monch, Carl-Wilhelm: *See*—
Lucht, Hartmut; and Monch, Carl-Wilhelm, 4,463,253, Cl. 250-213.0VT.

Moninski, Joseph P., Jr.: *See*—
Dizon, Edmund S.; and Moninski, Joseph P., Jr., 4,463,227, Cl. 200-50.00A.

Monma, Masao, to Konishiroku Photo Industry Co., Ltd. Electrostatic recording apparatus. 4,462,682, Cl. 355-15.000.

Mookherjee, Braja D.: *See*—
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,462,880, Cl. 204-161.000.

Moore, Daniel J.: *See*—
Daniels, Paul R.; Moore, Daniel J.; and Nguyen, Ha H., 4,463,444, Cl. 364-900.000.

Moraw, Roland; and Schaedlich, Gunther, to Hoechst Aktiengesellschaft. Process and apparatus for thermally fixing toner images. 4,462,675, Cl. 355-3.00R.

Morecroft, Derek W.: *See*—
Matthews, Peter H. D.; and Morecroft, Derek W., 4,462,918, Cl. 252-32.70E.

Morgan, Kenneth S.; and Brazell, James W., to Georgia Tech Research Institute. Wheelchair having anti-rollback mechanism. 4,462,605, Cl. 280-242.0WC.

Morgan, Robert C., to Incrediball, Inc. Game ball. 4,462,589, Cl. 273-60.00R.

Morgan, Steven R.: *See*—
Carlson, Linda A.; and Morgan, Steven R., 4,462,115, Cl. 2-2.000.

Morgenthaler, Allen C., to GK Technologies, Incorporated. Method for wire drawing. 4,462,242, Cl. 72-467.000.

Mori, Kei. Lighting device with dual reflecting members. 4,463,410, Cl. 362-20.000.

Morigaki, Masakazu: *See*—
Mitsui, Akio; and Morigaki, Masakazu, 4,463,085, Cl. 430-372.000.

Moriguchi, Fujio; Murayama, Tomio; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Step motor driving circuit. 4,463,301, Cl. 318-696.000.

Moriguchi, Haruhiko: *See*—
Kikuchi, Yoshiki; Ohmori, Takashi; and Moriguchi, Haruhiko, 4,463,360, Cl. 346-76.0PH.

Morita, Hiroshi: *See*—
Nakano, Hirotaka; Morita, Hiroshi; and Kato, Taketoshi, 4,463,216, Cl. 136-256.000.

Morita, Toyoo, to Yoshida Kogyo K.K. Holder for use in assembling top end-stops to slide fasteners. 4,462,154, Cl. 29-767.000.

Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, to Mitsubishi Oil Company, Ltd. Process for producing pitch for using as raw material for carbon fibers. 4,462,893, Cl. 208-40.000.

Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, to Mitsubishi Oil Co., Ltd. Process for producing pitch for using as raw material for carbon fibers. 4,462,894, Cl. 208-40.000.

Morris, Earl L.; and Hafner, V. Walter, to Acorn Engineering Company. Fabricated floor drain with large stepped flange for elastomeric trowelled covering. 4,462,123, Cl. 4-286.000.

Morris Township, Morris County: *See*—
Wu, Tse C.; and West, James C., 4,463,138, Cl. 526-319.000.

Morsbach, Martin: *See*—
Brauers, Bert; Kierst, Reiner; and Morsbach, Martin, 4,462,602, Cl. 277-139.000.

Morscheck, Timothy J., to Eaton Corporation. Synchronizer spring pin. 4,462,489, Cl. 192-53.00E.

Morwick, Tina M.; and Wikel, James H., to Eli Lilly and Company. Process for removing sulfonyl groups from benzimidazole isomers. 4,463,181, Cl. 548-306.000.

Moschak, George: *See*—
Fulmer, Frederick J.; and Moschak, George, 4,462,511, Cl. 222-52.000.

Moskovich, Jacob, to Vivitar Corporation. Zoom lens. 4,462,664, Cl. 350-427.000.

Motola, Patrick D.: *See*—
Dachowski, Richard P.; and Motola, Patrick D., 4,463,442, Cl. 364-900.000.

Motor Wheel Corporation: *See*—
Ogren, Robert S., 4,462,451, Cl. 157-1.170.

Motorola, Inc.: *See*—
Swartz, Craig, 4,463,274, Cl. 307-491.000.

Motosugi, Katsuhiko; and Koga, Ituo, to Toyota Jidosha Kabushiki Kaisha. Flow control device of a helically-shaped intake port for use in a diesel engine. 4,462,349, Cl. 123-188.00M.

Motoyama, Kazuyasu; and Kato, Toshikazu, to Olympus Optical Co., Ltd. Cassette tape recorder. 4,463,397, Cl. 360-137.000.

Motta, Bruno; and Nava, Erminio, to Rockwell-Rimoldi S.p.A. Stitch adjustment device for sewing machines. 4,462,325, Cl. 112-315.000.

Mouri, Yasunori: *See*—
Atago, Takeshi; Mouri, Yasunori; Kosuge, Tokuo; Furuhashi, Toshio; Abe, Osamu; and Hasegawa, Taiji, 4,462,378, Cl. 123-571.000.

Moyer, Patricia H.: *See*—
Beard, William O., Jr.; Cupit, Charles R.; and Moyer, Patricia H., 4,463,200, Cl. 570-224.000.

Mucke, Rainer; and Schiller, Johann, to Hoechst Aktiengesellschaft. Molding compositions which are based on vinyl chloride polymers and show increased white fracture effect. 4,463,119, Cl. 524-269.000.

Mueller, Robert S., to Eaton Corporation. Cooling arrangement for a viscous coupling utilized as a torque converter bypass. 4,462,492, Cl. 192-3.290.

Muenger, James R.: *See*—
Jahnke, Frederick C.; and Muenger, James R., 4,462,339, Cl. 122-7.00R.

Muggleworth, Simon D.; and Sparrow, Colin G., to Rolls Royce Limited. Rotor for fluid flow machine. 4,462,756, Cl. 416-215.000.
Mukumoto, Seiji: *See*—
Sogawa, Atushi; and Mukumoto, Seiji, 4,462,741, Cl. 414-225.000.
Mullane, William J., Jr.: *See*—
Ahr, Nicholas A.; Louis, Paul R.; Mullane, William J., Jr.; and Ouellette, William R., 4,463,045, Cl. 428-131.000.
Muller, Alfred: *See*—
Mohl, Helmut; Schwab, Manfred; Sauer, Joseph; Muller, Alfred; Leiber, Heinz; and Czinczel, Armin, 4,462,275, Cl. 74-866.000.
Muller, Gerald: *See*—
Dreyer, Hans; and Muller, Gerald, 4,462,612, Cl. 280-766.100.
Muller, J. Joseph, to ACF Industries, Inc. Pulsed bleed air throttle position controller. 4,462,359, Cl. 123-339.000.
Muller-Lierheim, Wolfgang: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 4,463,148, Cl. 526-264.000.
Muller, Ulrich: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 4,463,148, Cl. 526-264.000.
Mundus, Friedhelm; and Lippmann, Heinrich, to Windmoller & Holscher. Apparatus for treating and severing sections from intermittently fed webs. 4,462,857, Cl. 156-361.000.
Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, to Asahi Kasei Kogyo Kabushiki Kaisha. 1H-1,2,3-triazol-5-ylthio ester of N-carbobenzyloxy-p-hydroxyphenylglycine. 4,463,179, Cl. 548-255.000.
Murakami, Noboru; and Hasegawa, Hiromi, to Aisin Seiki Kabushiki Kaisha. Transmission for vehicles. 4,462,278, Cl. 74-868.000.
Murase, Masakazu: *See*—
Hirano, Toshinori; and Murase, Masakazu, 4,463,425, Cl. 364-417.000.
Murata, Kousaku: *See*—
Chibata, Ichiro; Kisumi, Masahiko; Komatsubara, Saburo; and Murata, Kousaku, 4,463,094, Cl. 435-115.000.
Murayama, Tomio: *See*—
Moriguchi, Fujio; Murayama, Tomio; and Ohmori, Takashi, 4,463,301, Cl. 318-696.000.
Muroga, Goro: *See*—
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,893, Cl. 208-40.000.
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,894, Cl. 208-40.000.
Murray, Ronald E.: *See*—
Boocock, John R. B.; and Murray, Ronald E., 4,462,939, Cl. 260-112.00R.
Muschner, Udo: *See*—
Hohberg, Alfried; and Muschner, Udo, 4,462,576, Cl. 266-220.000.
Muse, Joel, Jr.: *See*—
Nowak, Edward N.; Hollingshead, William S.; and Muse, Joel, Jr., 4,463,198, Cl. 568-768.000.
Musil, Rudolf V., to Siemens Aktiengesellschaft. Synchronous electric converter motor. 4,463,295, Cl. 318-436.000.
Nabisco Brands, Inc.: *See*—
Horwath, Robert O.; and Colonna, William J., 4,463,093, Cl. 435-94.000.
Nadella: *See*—
Mallet, Bernard, 4,462,524, Cl. 198-845.000.
Nadkarni, Anil V.: *See*—
Klar, Erhard; Nadkarni, Anil V.; and Samal, Prasanna K., 4,462,845, Cl. 148-13.200.
Nagai, Akihiro: *See*—
Noda, Etsunosuke; Matukura, Yoshiharu; and Nagai, Akihiro, 4,462,996, Cl. 424-243.000.
Nagao Iron Works Ltd.: *See*—
Sogawa, Atushi; and Mukumoto, Seiji, 4,462,741, Cl. 414-225.000.
Naito, Hideki; Hara, Hiroshi; and Sato, Kozo, to Fuji Photo Film Co., Ltd. Heat developable color photographic materials with redox dye releasers. 4,463,079, Cl. 430-203.000.
Nakabayashi, Hiroshi: *See*—
Watanabe, Teishiro; Tsunoi, Makoto; Kai, Toshio; Shiota, Hiroshi; Nakabayashi, Hiroshi; Tsutsumi, Tadayoshi; and Sakai, Ryuichi, 4,462,777, Cl. 425-87.000.
Nakagawa, Yasuo: *See*—
Saito, Takehide; and Nakagawa, Yasuo, 4,462,919, Cl. 252-62.540.
Nakahara, Yutaka; Akutsu, Mitsuo; Haruna, Tohru; and Takahashi, Masayuki. Bis-phenol phosphates as clarifiers for polyolefin resins. 4,463,113, Cl. 524-117.000.
Nakahara, Yutaka: *See*—
Leistner, William E.; Minagawa, Motoaobu; Nakahara, Yutaka; and Kitsukawa, Kazumi, 4,463,112, Cl. 524-109.000.
Nakajima, Kosaku: *See*—
Sato, Isao; and Nakajima, Kosaku, 4,462,173, Cl. 38-93.000.
Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Heating apparatus with decorative light effect. 4,462,789, Cl. 431-126.000.
Nakamura, Kenichi, to Hitachi, Ltd. Armature winding. 4,462,859, Cl. 310-198.000.
Nakamura, Makoto; Chiyoda, Tsutomu; and Hasegawa, Shinichi, to Sumitomo Chemical Company, Limited. Method for purifying phloroglucin. 4,463,197, Cl. 568-754.000.
Nakamura, Makoto: *See*—
Chiyoda, Tsutomu; Nakamura, Makoto; and Hasegawa, Shinichi, 4,463,199, Cl. 568-768.000.
Nakamura, Yoshimitsu, to Matsushita Electric Works, Ltd. Coil unit of coreless armature and method of manufacturing the same. 4,463,276, Cl. 310-266.000.
Nakane, Masami: *See*—
Haslanger, Martin F.; and Nakane, Masami, 4,463,015, Cl. 424-285.000.
Nakanishi Metal Works Co., Ltd.: *See*—
Wakabayashi, Takao, 4,462,315, Cl. 104-172.00S.
Nakano, Hirotaka; Morita, Hiroshi; and Kato, Taketoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Solar cell. 4,463,216, Cl. 136-256.000.
Nakao, Shinroku; and Kobayashi, Kouichi, to Combi Co., Ltd. Reclining mechanism for baby carriage. 4,462,607, Cl. 280-644.000.
Nakao, Shunichi; Yamauchi, Motonori; and Suzuki, Churyo, to Showa Jakuhin Kako Co., Ltd.; and Tokyo Boshi Kabushiki Kaisha. Dental implement for removing plaque and massaging gums. 4,462,136, Cl. 15-167.00R.
Nalco Chemical Company: *See*—
Diep, Daniel V.; and Grattan, David A., 4,462,830, Cl. 106-14.140.
Gross, Anthony E.; Branning, Merle L.; and Fong, Dodd W., 4,462,808, Cl. 44-51.000.
Payne, Charles C., 4,462,188, Cl. 51-283.00R.
Namazue, Hirotoshi: *See*—
Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, 4,463,349, Cl. 340-825.320.
Nambu, Tatsuo. Method and apparatus for discharging objects from holders. 4,462,201, Cl. 53-475.000.
Namiki, Tomizo: *See*—
Kitajima, Masao; Seshimoto, Osamu; Namiki, Tomizo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Mizobuchi, Yuzo, 4,463,083, Cl. 430-273.000.
Nanasi, Pal: *See*—
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.
Nanjyo, Hirotoshi; Serizawa, Hiroshi; and Sagae, Michio, to Kokusan Denki Co., Ltd. Ignition system for internal combustion engine. 4,462,363, Cl. 123-427.000.
Nardella, Alessandro. Double screw for a four part activator in jaw orthopedics. 4,462,799, Cl. 433-7.000.
Narita, Ryuho; and Aoshima, Terutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric rice cooker. 4,463,249, Cl. 219-441.000.
Nath, Prem; and Gattuso, David A., to Energy Conversion Devices, Inc. Magnetic gas gate. 4,462,332, Cl. 118-718.000.
Nath, Prem; Hoffman, Kevin R.; and Laarman, Timothy D., to Energy Conversion Devices, Inc. Process gas introduction, confinement and evacuation system for glow discharge deposition apparatus. 4,462,333, Cl. 118-723.000.
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Hinnenkamp, James A.; and Walatka, Vernon V., Jr., 4,462,971, Cl. 423-277.000.
McClain, Dorothee M., 4,462,948, Cl. 264-140.000.
National Research Development Corporation: *See*—
Bowman, George E., 4,463,261, Cl. 250-339.000.
National Starch and Chemical Corporation: *See*—
Perlinski, Witold; Davis, Irwin J.; and Romanick, John F., 4,463,110, Cl. 523-409.000.
Nauman, John D., to Allegheny Ludlum Steel Corporation. Annular tuyere. 4,462,824, Cl. 75-60.000.
Nava, Erminio: *See*—
Motta, Bruno; and Nava, Erminio, 4,462,325, Cl. 112-315.000.
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Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, 4,462,750, Cl. 415-54.000.
NCR Corporation: *See*—
Adelberger, Donald L., 4,462,509, Cl. 221-259.000.
Thomas, Jacob E., 4,463,362, Cl. 346-140.00R.
Neal, James V., Jr.: *See*—
Fajt, John; and Neal, James V., Jr., 4,462,518, Cl. 198-479.000.
Nedelec, Alain L.: *See*—
Guerret, Patrick G.; Bucher, Bernard P.; Dostert, Philippe L.; Mocquet, Gisele C.; and Nedelec, Alain L., 4,463,004, Cl. 424-248.500.
Needham, Dale M.: *See*—
Haman, David F.; and Needham, Dale M., 4,462,346, Cl. 123-73.00A.
Neff, James A., to MAC Valves, Inc. Four-way stacking valve with common electrical conduit and body mounted individual exhaust flow controls that project through the cover. 4,462,427, Cl. 137-625.640.
Nei Canada Limited: *See*—
Browne, John P., 4,462,177, Cl. 40-463.000.
Nelle, Guenther, to Dr. Johannes Heidenhain GmbH. Reference mark selection system for measuring apparatus. 4,462,159, Cl. 33-125.00C.
Nel's Laboratory, Inc.: *See*—
Burgess, Nelson L., 4,463,016, Cl. 424-347.000.
Nelson, Robert L., to Westinghouse Electric Corp. Method of operating a gas analyzer and solid electrolyte gas sensing apparatus. 4,462,872, Cl. 204-1.00T.
Nelson, Wayne F., to A. Schulman, Inc. Plastic-metal laminate, process, and composition. 4,463,054, Cl. 428-458.000.
Nerinckx, Daniel E.: *See*—
Shinada, Yasukazu; and Nerinckx, Daniel E., 4,463,129, Cl. 525-63.000.
Neszmelyi, Andras: *See*—
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.

Newman, John W., to Laser Technology, Inc. Hologram apparatus for detecting flaws with developing chamber. 4,462,668, Cl. 354-317.000.
Nguyen, Ha H.: *See—*
Daniels, Paul R.; Moore, Daniel J.; and Nguyen, Ha H., 4,463,444, Cl. 364-900.000.
Nickerson, David L. Insulating insert for masonry building block and method for making same. 4,462,195, Cl. 52-405.000.
Nielsen, Robert J., to AT&T Bell Laboratories. Hydraulically driven X-Y stage. 4,462,580, Cl. 269-73.000.
Nifco, Inc.: *See—*
Omata, Nobuaki, 4,462,630, Cl. 296-37.900.
Nilsen, Ole K. DC Ballasting means for fluorescent lamps. 4,463,285, Cl. 315-205.000.
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Lars G., to PLM AB. Method of producing a tubular article having an annular groove therein. 4,462,950, Cl. 264-292.000.
Ninomiya, Ken: *See—*
Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; Kanomata, Ichiro; Okudaira, Sadayuki; and Saida, Hiroji, 4,462,863, Cl. 156-643.000.
Nippon Columbia Kabushikikaisha: *See—*
Yamanoi, Masaru; and Satoh, Hiroshi, 4,463,223, Cl. 179-156.00R.
Nippon Electric Co., Ltd.: *See—*
Takane, Hisao, 4,463,419, Cl. 364-200.000.
Nippon Hoso Kyokai: *See—*
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.
Nippon Kogaku K.K.: *See—*
Maida, Osamu, 4,462,670, Cl. 354-425.000.
Nippon Light Metal Company Limited: *See—*
Ito, Tadao; and Hashimoto, Akio, 4,462,961, Cl. 420-534.000.
Nippon Oil and Fats Company, Ltd.: *See—*
Mizuno, Mitsuo; Suginaka, Akinori; Fujii, Masahiko; and Akimoto, Shinichi, 4,462,984, Cl. 424-78.000.
Nippon Paint Co., Ltd.: *See—*
Kuwajima, Teruaki; and Matsumura, Akira, 4,463,111, Cl. 523-413.000.
Takeuchi, Kunihiko; and Okuda, Hidefumi, 4,463,038, Cl. 427-407.100.
Nippon Sheet Glass Co., Ltd.: *See—*
Shimizu, Masayoshi; Yamagishi, Takashi; and Noguchi, Yukio, 4,462,663, Cl. 350-413.000.
Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Hanaoka, Masanori; Hashiguchi, Yukihide; Ootsuka, Yoshinori; and Yamaguchi, Hiroaki, 4,462,247, Cl. 73-35.000.
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; and Idogaki, Takaharu, 4,462,377, Cl. 123-571.000.
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,462,379, Cl. 123-569.000.
Nippon Steel Corporation: *See—*
Kameyama, Kazuhide; Kiyofuji, Takahiro; and Shigeyama, Yukinori, 4,462,456, Cl. 164-448.000.
Otoguro, Yasuo; Yamanaka, Mikio; Hashimoto, Katukuni; Sakakibara, Mizuo; and Onoyama, Masao, 4,463,061, Cl. 428-683.000.
Takahashi, Tsunetoshi; Suzuki, Masao; and Okinaka, Tadayuki, 4,462,844, Cl. 148-12.00E.
Nippon Telegraph & Telephone Public Corp.: *See—*
Ishii, Yasunobu; Asai, Kazuyoshi; and Kurumada, Katsuhiko, 4,463,366, Cl. 357-22.000.
Tokunaga, Yukio; Ikeda, Yasuhisa; Seto, Tadao; and Shimazaki, Yoshikazu, 4,463,034, Cl. 427-256.000.
Nippondenso Co., Ltd.: *See—*
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,462,491, Cl. 192-84.00R.
Yamanaka, Takayuki, 4,462,218, Cl. 62-175.000.
Nishihata, Toshiaki: *See—*
Higuchi, Takeru; and Nishihata, Toshiaki, 4,462,991, Cl. 424-177.000.
Nishijima, Masayuki; Koizumi, Morimasa; and Matsuda, Minoru, to Sanyo-Kokusaku Pulp Co., Ltd. Baking and cooking tray sheet and its manufacturing method. 4,463,029, Cl. 427-209.000.
Nishikawa, Masaji, to Olympus Optical Company Ltd. Copying apparatus of moving document type capable of copying an optical image projected from an option device. 4,462,674, Cl. 355-3.00R.
Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; Kanomata, Ichiro; Okudaira, Sadayuki; and Saida, Hiroji, to Hitachi, Ltd. Microwave plasma etching. 4,462,863, Cl. 156-643.000.
Nishimura, Hidetaro; and Nozawa, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming energy beam activated conductive regions between circuit elements. 4,462,150, Cl. 29-576.00B.
Nishimura, Yuji; and Tanaka, Hideki, to Kabushiki Kaisha Tokai Rika Denki Seisakusho; and Toyota Jidosha Kogyo Kabushiki Kaisha. Slider for automatic seat belt arrangement. 4,462,613, Cl. 280-804.000.
Nishio, Masakazu: *See—*
Okuhara, Akira; Kotaka, Yasuyosi; Nishio, Masakazu; Sato, Susumu; Watanabe, Isamu; and Inoue, Masaru, 4,463,019, Cl. 426-17.000.
Nishiura, Yoshikazu; Mineyama, Takitsugu; and Inoue, Kazuo, to Sharp Kabushiki Kaisha. System clock generator in integrated circuit. 4,463,440, Cl. 364-900.000.
Nishizawa, Yoshihiko; Takezawa, Taihei; and Shinohara, Takashi, to Kikkoman Corporation; and Mann's Wine Co., Ltd. Flavoring material and process for producing drinks and foods excellent in flavor. 4,463,024, Cl. 426-533.000.
Nissan Chemical Industries, Inc.: *See—*
Sakata, Gojyo; Numata, Tatsuo; Kusano, Kazuya; Hirose, Masayoshi; and Hirata, Kiminori, 4,462,994, Cl. 424-200.000.
Nissan Motor Company, Limited: *See—*
Fujii, Hiroshi; and Kamegaya, Sigeru, 4,462,351, Cl. 123-198.00F.
Ito, Yoshikazu, 4,462,283, Cl. 81-57.370.
Maeda, Kouzo, 4,462,633, Cl. 296-188.000.
Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, 4,463,349, Cl. 340-825.320.
Seko, Yasutoshi; and Yanagishima, Takayuki, 4,463,347, Cl. 340-576.000.
Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,462,280, Cl. 74-868.000.
Touda, Masayuki; Akimune, Yoshio; and Matoba, Kazuo, 4,462,890, Cl. 204-425.000.
Uemura, Masakazu, 4,462,757, Cl. 416-244.00R.
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Nobuhiro, Ono: *See—*
Takuji, Koyanagi; Nobuhiro, Ono; and Hiroyuki, Kitamura, 4,463,041, Cl. 428-35.000.
Noda, Etsunosuke; Matukura, Yoshiharu; and Nagai, Akihiro, to Takeda Chemical Industries, Ltd. Aqueous suspension of oxendolone. 4,462,996, Cl. 424-243.000.
Noe, William J., to Maytag Company, The. Appliance leveling and locating structure. 4,462,225, Cl. 68-3.00R.
Nogami, Sumitaka; Wakabayashi, Tsuneo; Ono, Eiichi; Kitahama, Yoshiharu; and Iwami, Isamu, to Asahi-Dow Limited. Polynuclear fused aromatic ring type polymer and preparation thereof. 4,463,162, Cl. 528-190.000.
Noguchi, Takashi: *See—*
Soneda, Mitsuo; Noguchi, Takashi; and Ohtsu, Takaji, 4,463,383, Cl. 358-212.000.
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Nolte, Gerhard: *See—*
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Nomura, Masaaki; Watanabe, Yukihiro; and Yamamoto, Keiiti, to Aisan Kogyo Kabushiki Kaisha. Air-fuel ratio control circuit for an internal combustion engine. 4,462,366, Cl. 123-440.000.
Nomura, Tatsuei: *See—*
Okamoto, Kouichi; Oishi, Norio; Sakuyama, Masaki; Nomura, Tatsuei; Yamada, Tadatoshi; and Iwamoto, Masatami, 4,462,152, Cl. 29-598.000.
Nonaka, Yasuhiko: *See—*
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.
Noonan, John M.; and Perlstein, Jerome H., to Eastman Kodak Company. Condensation polymeric photoconductors containing pendant arylamines. 4,463,078, Cl. 430-73.000.
Noranda Mines Limited: *See—*
Kallio, William R., 4,462,575, Cl. 266-158.000.
Nordstrom, Arnold B., to Ancra Corporation. Roller rail assembly for cargo loading system. 4,462,493, Cl. 193-35.00R.
Norland, Kenneth S.: *See—*
Ferguson, John H.; Norland, Kenneth S.; and Sofen, Stephen R., 4,463,082, Cl. 430-228.000.
Norman, Erik B.; and Yngstrom, Sven A. Orienteering compass. 4,462,164, Cl. 33-355.00R.
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DeCaro, Aristide R., 4,463,277, Cl. 313-25.000.
Justice, James W. H., 4,463,286, Cl. 315-219.000.
Northern Petrochemical Company: *See—*
Foerster, Rolf F., 4,463,102, Cl. 502-127.000.
Northern Telecom Limited: *See—*
Berger, Jean P.; and Crothers, Carlyle W., 4,463,407, Cl. 361-306.000.
DeBortoli, George, 4,462,153, Cl. 29-760.000.
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Foster, Bryan D., 4,462,798, Cl. 432-258.000.
Norzink A/S: *See—*
Jore, Torleif N., 4,462,960, Cl. 420-519.000.
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Serini, Volker; Peters, Horst; Rudolph, Udo; Buekers, Josef; Nouvertne; and Freitag, Dieter, 4,463,130, Cl. 525-67.000.
Novo Industri A/S: *See—*
Diedrichsen, Allan; Johannessen, Marie; and Tang, Peter, 4,462,980, Cl. 424-1.100.
Nowak, Edward N.; Hollingshead, William S.; and Muse, Joel, Jr., to Goodyear Tire & Rubber Company, The. Method for the rearrangement of dialkylbenzene dihydroperoxides to dihydric phenols. 4,463,198, Cl. 568-768.000.
Nozawa, Hiroshi: *See—*
Nishimura, Hidetaro; and Nozawa, Hiroshi, 4,462,150, Cl. 29-576.00B.
Numata, Tatsuo: *See—*
Sakata, Gojyo; Numata, Tatsuo; Kusano, Kazuya; Hirose, Masayoshi; and Hirata, Kiminori, 4,462,994, Cl. 424-200.000.
Nusz, Anthony W.: *See—*
Wilson, Julian B., Jr.; and Nusz, Anthony W., 4,462,227, Cl. 68-5.00D.

Obermann, George; Kothe, Erich; and Redfield, William H., to Singer Company, The. Dryer timer. 4,463,225, Cl. 200-35.00R.
O'Brien, Larry S.; and Kaler, Ward S., to Leco Corporation. Analytical furnace. 4,462,963, Cl. 422-78.000.
Occidental Research Corporation: *See*—
McKinley, John R.; and Roeschlaub, John G., 4,462,495, Cl. 209-3.300.
Oce-Nederland B.V.: *See*—
Aerts, Wilhelmus J.; ter Horst, Gerhardus E. R.; and Linssen, Johannus L. J. M., 4,462,681, Cl. 355-14.0SH.
O'Connell, Daniel D.; and Broz, Thomas A., to United States Gypsum Company. Sprayable acoustical composition. 4,463,039, Cl. 427-421.000.
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., to Olin Corporation. Modified polyurethane liquid polymer compositions. 4,463,158, Cl. 528-75.000.
Oda, Yukihisa; Sakakibara, Naoji; and Amano, Hiroyuki, to Aisin Seiki Kabushiki Kaisha. Speed sensor device. 4,463,312, Cl. 324-174.000.
Odom, Ira E.: *See*—
Alexander, William; and Odom, Ira E., 4,462,470, Cl. 175-72.000.
Ogata, Masaru; Tawara, Katsuya; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Takahashi, Toshio, to Shionogi & Co., Ltd. Bis-imidazolyl-bis-phenylmethane derivatives and their use as fungicides. 4,463,011, Cl. 424-273.00R.
Ogden Electronics Ltd.: *See*—
Steel, James, 4,462,479, Cl. 180-171.000.
Ogle, Peter C.; and Hibyan, Edward S., to United States of America, Navy. Anvil-strap rotor. 4,462,755, Cl. 416-132.00R.
Ogren, Robert S., to Motor Wheel Corporation. Method and apparatus for removing tires from rims. 4,462,451, Cl. 157-1.170.
Ohba, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Bill packet discharging apparatus. 4,462,506, Cl. 221-13.000.
Ohkawa, Nobuhisa: *See*—
Isobe, Toshiaki; and Ohkawa, Nobuhisa, 4,462,375, Cl. 123-491.000.
Ohmori, Takashi: *See*—
Kikuchi, Yoshiki; Ohmori, Takashi; and Moriguchi, Haruhiko, 4,463,360, Cl. 346-76.0PH.
Moriguchi, Fujio; Murayama, Tomio; and Ohmori, Takashi, 4,463,301, Cl. 318-696.000.
Ohshima, Keisuke: *See*—
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Ohtsu, Takaji: *See*—
Soneda, Mitsuo; Noguchi, Takashi; and Ohtsu, Takaji, 4,463,383, Cl. 358-212.000.
Ohtsuka, Kunio: *See*—
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Oil Process Systems, Inc.: *See*—
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Oishi, Norio: *See*—
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Okamoto, Kouichi; Oishi, Norio; Sakuyama, Masaki; Nomura, Tatsuei; Yamada, Tadatoshi; and Iwamoto, Masatami, to Mitsubishi Denki Kabushiki Kaisha. Method of mounting coils on the rotor of a superconductive rotary electric machine. 4,462,152, Cl. 29-598.000.
Okamoto, Rokuro: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Tatsuta, Kuniaki; Ishikura, Tomoyuki; Okamoto, Rokuro; Yamamoto, Masao; and Kiyoshima, Kohki, 4,463,171, Cl. 536-7.100.
Okinaka, Tadayuki: *See*—
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Okkerse, Simon W. J. H.; Friesen, Robert J.; and Robar, James D. J., to SED Systems Inc. Seed flow monitor. 4,463,345, Cl. 340-505.000.
Okuda, Hidefumi: *See*—
Takeuchi, Kunihiko; and Okuda, Hidefumi, 4,463,038, Cl. 427-407.100.
Okudaira, Sadayuki: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; Kanomata, Ichiro; Okudaira, Sadayuki; and Saida, Hiroji, 4,462,863, Cl. 156-643.000.
Okuhara, Akira; Kotaka, Yasuyosi; Nishio, Masakazu; Sato, Susumu; Watanabe, Isamu; and Inoue, Masaru, to Kikkoman Corporation. Stationary process for producing vinegar. 4,463,019, Cl. 426-17.000.
Okunaka, Masaaki: *See*—
Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki; Kawanabe, Takao; and Tanabe, Isao, 4,463,073, Cl. 430-5.000.
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Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,462,457, Cl. 164-503.000.
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,463,158, Cl. 528-75.000.
Olschner, Hans: *See*—
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Olson, John G.; and Kmiecik, Joseph C., to AT&T Technologies, Inc. Split reel with quick-release flange. 4,462,555, Cl. 242-118.600.
Olympus Optical Co., Ltd.: *See*—
Motoyama, Kazuyasu; and Kato, Toshikazu, 4,463,397, Cl. 360-137.000.
Nishikawa, Masaji, 4,462,674, Cl. 355-3.00R.
Osanai, Akira, 4,463,395, Cl. 360-105.000.
Osanai, Akira, 4,463,396, Cl. 360-105.000.
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Omata, Nobuaki, to Nifco, Inc. Ashtray device. 4,462,630, Cl. 296-37.900.
OMI International Corporation: *See*—
Tomaszewski, Lillie C.; and Tremmel, Robert A., 4,462,874, Cl. 204-52.00R.
Onishi, Taijiro: *See*—
Kikuchi, Noribumi; Suzuki, Yasuo; Onishi, Taijiro; and Washizu, Fumio, 4,463,033, Cl. 427-255.300.
Onoda, Shigeyoshi, to Canon Kabushiki Kaisha. Image formation apparatus using a process unit with a protective cover. 4,462,677, Cl. 355-3.00R.
Onodera, Teruyuki: *See*—
Kitagawa, Hiroshi; Onodera, Teruyuki; Fukushima, Toshiyuki; and Hayashi, Yoriyuki, 4,462,896, Cl. 208-253.000.
Onoki, Seiji: *See*—
Kajiura, Koichi; Edanami, Kozo; Onoki, Seiji; Izumina, Tatsuya; and Kumeda, Yasuo, 4,463,350, Cl. 340-825.010.
Onopchenko, Judith B.; Singerman, Gary M.; and Sebulsky, Raynor T., to Gulf Research & Development Company. Quaternary phosphonium thiostannates. 4,462,935, Cl. 260-429.700.
Onoyama, Masao: *See*—
Otoguro, Yasuo; Yamanaka, Mikio; Hashimoto, Katukuni; Sakakibara, Mizuo; and Onoyama, Masao, 4,463,061, Cl. 428-683.000.
Oohashi, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Distributor for suppressing electromagnetic waves of an internal combustion engine. 4,463,224, Cl. 200-19.0DC.
Oono, Eiichi: *See*—
Nogami, Sumitaka; Wakabayashi, Tsuneo; Oono, Eiichi; Kitahama, Yoshiharu; and Iwami, Isamu, 4,463,162, Cl. 528-190.000.
Ootsuka, Yoshinori: *See*—
Hattori, Tadashi; Hanaoka, Masanori; Hashiguchi, Yukihide; Ootsuka, Yoshinori; and Yamaguchi, Hiroaki, 4,462,247, Cl. 73-35.000.
Opalka, Chester J., Jr.: *See*—
Lesher, George Y.; Opalka, Chester J., Jr.; and Singh, Baldev, 4,463,008, Cl. 424-263.000.
Opelika Manufacturing Corporation: *See*—
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Optical Coating Laboratory, Inc.: *See*—
Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., 4,463,047, Cl. 428-216.000.
O'Quin, John T., II; Vosaman, Robert A.; and Wood, Rebecca S., to International Business Machines Corporation. Error correction from remote data processor by communication and reconstruction of processor status storage dink. 4,463,418, Cl. 364-200.000.
Oram, Stephen W. Ship hull cleaning device. 4,462,328, Cl. 114-222.000.
Orban, John M., to Vivitar Corporation. Automatic zoom flash. 4,462,666, Cl. 354-126.000.
Orbital Engine Company Proprietary Limited: *See*—
Sarich, Tony R.; Johnsen, Kenneth N.; and McKay, Michael L., 4,462,760, Cl. 417-54.000.
Orcutt, John W., to Texas Instruments Incorporated. Plastic surface mounted high pinout integrated circuit package. 4,463,217, Cl. 174-52.0FP.
Osaka, Hiroshi; Honma, Akira; and Kanai, Ryokichi, to Clarion Co., Ltd. Television signal processing system for a wireless pay system. 4,463,376, Cl. 358-120.000.
Osaka Petrochemical Industries Ltd.: *See*—
Kitagawa, Hiroshi; Onodera, Teruyuki; Fukushima, Toshiyuki; and Hayashi, Yoriyuki, 4,462,896, Cl. 208-253.000.
Osanai, Akira, to Olympus Optical Co., Ltd. Support mechanism for a head lever of a cassette tape recorder. 4,463,395, Cl. 360-105.000.
Osanai, Akira, to Olympus Optical Co., Ltd. Method for selecting any one of heads of a cassette tape recorder of automatic reverse type, and a head selection mechanism for its practice. 4,463,396, Cl. 360-105.000.
Osborne Industries, Inc.: *See*—
Thibault, Ronald M., 4,462,338, Cl. 119-53.500.
Osdor, Asriel. Method of trapping and utilizing solar heat. 4,462,389, Cl. 126-415.000.
Ose, Earl E.: *See*—
Johnson, Ronald D.; Kastner, Ralph M.; Larsen, Stephen H.; and Ose, Earl E., 4,463,092, Cl. 435-70.000.
Oshima, Takao: *See*—
Hino, Minoru; Oshima, Takao; and Tachibana, Akihiro, 4,463,134, Cl. 525-109.000.
Osika, Thomas F., to McGill Manufacturing Company, Inc. Portable electrical switch and outlet unit. 4,463,228, Cl. 200-51.00R.
Oskam, Herman, to Hunter Douglas International N.V. Slat apparatus for roof construction. 4,462,452, Cl. 160-176.00R.
Ostergren, Carl D.: *See*—
Meagher, Ralph E.; and Ostergren, Carl D., 4,462,462, Cl. 165-80.00C.
Ostrowsky, Efrem M.: *See*—
Luenser, Werner R.; and Ostrowsky, Efrem M., 4,462,502, Cl. 215-329.000.

Oswald, Hendrikus J.; Li, Hsin L.; and Butler, Russell H., to Allied Corporation. Method for controlling texture level in a moving cavity texturing process. 4,462,143, Cl. 28-257.000.

Otavi Minen AG: *See*—
Car, Martin, 4,462,835, Cl. 106-75.000.

Otis Elevator Company: *See*—
Ericson, Richard J., 4,462,193, Cl. 52-282.000.

Otis Engineering Corporation: *See*—
Strickland, Cynthia E., 4,462,465, Cl. 166-117.500.

Otoguro, Yasuo; Yamanaka, Mikio; Hashimoto, Katukuni; Sakakibara, Mizuo; and Onoyama, Masao, to Nippon Steel Corporation. Boiler tube having improved high temperature mechanical strength, improved high temperature corrosion resistant property and resistance to embrittlement during service. 4,463,061, Cl. 428-683.000.

Otsuki, Masaaki, to General Electric Company. Polishing agent composition. 4,462,828, Cl. 106-3.000.

Ottenberg, Lee: *See*—
Ottenberg, Ray, 4,463,020, Cl. 426-19.000.

Ottenberg, Ray, to Ottenberg, Lee, a part interest. Yeast-raisable wheat-based food products that exhibit reduced deterioration in palatability upon exposure to microwave energy. 4,463,020, Cl. 426-19.000.

Otzen, Karl G., to Safety-Kleen Corporation. Parts cleaner adapted for simplified service. 4,462,415, Cl. 134-111.000.

Oubridge, Terence J.; and Boorman, Ben, to Kimberly-Clark Limited. Paper web drying apparatus having a hood with two sections. 4,462,868, Cl. 162-280.000.

Ouellette, William R.: *See*—
Ahr, Nicholas A.; Louis, Paul R.; Mullane, William L., Jr.; and Ouellette, William R., 4,463,045, Cl. 428-131.000.

Outboard Marine Corporation: *See*—
Brown, Peter W., 4,462,945, Cl. 261-50.00R.
Haman, David F.; and Needham, Dale M., 4,462,346, Cl. 123-73.00A.
Kutzler, John M., 4,463,315, Cl. 324-382.000.

Overman, Joseph D., to Du Pont de Nemours, E. I., and Company. Silver halide antifoggants based on quinoxaline derivatives and related heterocycles. 4,463,088, Cl. 430-614.000.

Owen, Geraint; and Rissman, Paul, to Hewlett-Packard Company. Electron beam proximity effect correction by reverse field pattern exposure. 4,463,265, Cl. 250-492.200.

Owens-Corning Fiberglas Corporation: *See*—
Dickson, Lyle C.; Hall, Chester A., Jr.; and Havens, Arthur B., 4,463,048, Cl. 428-218.000.
Propster, Mark A.; and Streicher, William L., 4,462,815, Cl. 65-2.000.

Owens-Illinois, Inc.: *See*—
Steele, Scott W., 4,463,056, Cl. 428-542.800.

Owoc, James R.; and Tremblay, Richard P., to Kerotest Manufacturing Corp. Bellows sealed stem for rotary valve. 4,462,422, Cl. 137-557.000.

Oxenrider, Bryce C., to Allied Corporation. Process for the use of oligomer as fiber surface treating agent. 4,463,037, Cl. 427-389.900.

Oy Wartsila A.B.: *See*—
Koutonen, Pauli; and Alanco, Lars-Erik, 4,463,251, Cl. 235-470.000.

Ozaki, Syunzaburo; and Niwa, Tooru, to Honda Giken Kogyo Kabushiki Kaisha. Throttle valve control apparatus for internal combustion engine. 4,462,355, Cl. 123-325.000.

Ozawa, Kunitaka: *See*—
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,463,361, Cl. 346-134.000.

P.C. Freiberg Pty. Ltd.: *See*—
Freiberg, Peter C., 4,462,196, Cl. 52-586.000.

Pace, Max L.; Shipley, Fred J.; and Webb, Jerald H., to Healthdyne, Inc. Pressure transducer dome. 4,462,409, Cl. 128-675.000.

Pack, Hugo: *See*—
Ruch, Jean; Katrysiok, Detlef; Pack, Hugo; and Tillmann, Heinz-Gunther, 4,463,064, Cl. 429-27.000.

Packschies, Werner; and Miethe, Gunther, to Kleinewefers, Jaeggli AG. Apparatus for mercerizing textiles and fabrics. 4,462,228, Cl. 68-22.00R.

Padawer, Gerald M., to Grumman Aerospace Corporation. Positron-annihilation-radiation transmission gauge. 4,463,263, Cl. 250-363.00R.

Paice, Derek A.; and Wood, Peter, to Westinghouse Electric Corp. DC Static switch with phase commutation. 4,463,400, Cl. 361-5.000.

Pakus, Edward: *See*—
Cohen, Howard; and Pakus, Edward, 4,462,160, Cl. 33-138.000.

Palani, Narayanaswami. Wave action machine. 4,462,762, Cl. 417-332.000.

Palmisano, James B.: *See*—
Gifford, Paul R.; Palmisano, James B.; Shacklette, Lawrence W.; Chance, Ronald R.; and Toth, James E., 4,463,072, Cl. 429-194.000.

PanCanadian Petroleum Limited: *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.

Paradis, Joseph R. Resealable tamper-proof closures. 4,462,505, Cl. 220-266.000.

Parkell, Edward; and Tamagni, Albert J., to Maul Technology Corporation. Glass container pusher. 4,462,519, Cl. 198-490.000.

Parker, Dane K.: *See*—
D'Sidocky, Richard M.; and Parker, Dane K., 4,463,191, Cl. 564-398.000.

Parker, Donald L.: *See*—
Warwick, Edward H.; Parker, Donald L.; and Kaup, Ralph J., 4,462,487, Cl. 192-4.00A.

Parker, Robert P., to RCA Corporation. Kinescope black level current sensing apparatus. 4,463,385, Cl. 358-242.000.

Parkinson, David W.: *See*—
de Mello, P. Paul; Hannett, Louis N.; Parkinson, David W.; and Czuba, John S., 4,463,306, Cl. 322-25.000.

Parks, George R.: *See*—
Smith, Charles F.; Parks, George R.; Correa, Gustavo A.; and Holley, Ralph N., 4,462,714, Cl. 405-55.000.

Parlman, Robert M.; and Bresson, Clarence R., to Phillips Petroleum Company. Ore flotation with combined collectors. 4,462,898, Cl. 209-166.000.

Pascarella, Vincent J.: *See*—
McGary, Charles W., Jr.; Pascarella, Vincent J.; Rhodes, Delmer R.; and Taller, Robert A., 4,463,156, Cl. 528-65.000.

Pascoe, Robert A.: *See*—
Czyszczewski, Joseph S.; Pascoe, Robert A.; and Stafford, James M., 4,462,701, Cl. 400-3.000.

Pask, Neil: *See*—
Tooth, Alan J.; and Pask, Neil, 4,462,866, Cl. 162-103.000.

Passmore, Paul R.: *See*—
Warmack, Ralph E.; Marney, O. Guy, Jr.; Gallagher, John N.; and Passmore, Paul R., 4,463,451, Cl. 367-16.000.

Pastor, Antonio C.: *See*—
Pastor, Ricardo C.; Pastor, Antonio C.; Gorre, Luisa E.; and Chew, Remedios K., 4,462,970, Cl. 423-263.000.
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Triebel, Walter; and Bunke, Heinz, 4,463,281, Cl. 313-623.000.

Patrick, John P.: *See*—
Harner, Kermit I.; Patrick, John P.; and Vosseller, Kenneth F., 4,462,753, Cl. 416-48.000.

Pauling, Horst; Wehrli, Christof; and Vorsanger, Jean-Jacques, to Hoffmann-La Roche Inc. Process and intermediates for the manufacture of (3aS, 6aR)-1,3-dibenzyldihydro-1H-furo[3,4-d] imidazole-2,4(3H,3aH)-dione. 4,463,180, Cl. 548-303.000.

Payne, Charles C., to Nalco Chemical Company. Silica sol compositions for polishing silicon wafers. 4,462,188, Cl. 51-283.00R.

Pearl, David R., to Gerber Garment Technology, Inc. Apparatus for cutting and notching sheet material. 4,462,292, Cl. 83-471.200.

Peck, Carrol E.: *See*—
Caplis, Thomas J.; Peck, Carrol E.; and Felton, John C., 4,462,747, Cl. 414-567.000.

Peck, Paul L.: *See*—
Tentler, Lynn A.; and Peck, Paul L., 4,462,163, Cl. 33-265.000.

Peev, Vassil G.: *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.

Pellegrini, Bruno; and Arnold, David E. Automatic, remote signal source selector. 4,463,382, Cl. 358-181.000.

Pemco-Kalamazoo, Inc.: *See*—
Black, John W., 4,462,138, Cl. 16-44.000.

Penland, Joe E., Sr., to Quality Mat Company. Method and apparatus for a construction site flooring system. 4,462,712, Cl. 404-36.000.

Penney, C. Bradford; Zabec, Glenn M.; and Sridharan, Sri P., to Streamlight, Inc. Rechargeable lamp assembly, mounting unit, and circuit therefor. 4,463,283, Cl. 315-87.000.

Perego, Giuseppe; and Garagiola, Adelmo, to Rockwell-Rimoldi S.p.A. Tape feed drive for sewing machines. 4,462,326, Cl. 112-318.000.

Perel, Julius: *See*—
Mahoney, John F.; and Perel, Julius, 4,462,806, Cl. 23-293.00R.

Perkins, Warren E., to $CRYO_2$ Corporation. Method and means for preventing coupling freezing. 4,462,223, Cl. 62-514.00R.

Perlinski, Witold; Davis, Irwin J.; and Romanick, John F., to National Starch and Chemical Corporation. Neoprene latex contact adhesives. 4,463,110, Cl. 523-409.000.

Perlstein, Jerome H.: *See*—
Noonan, John M.; and Perlstein, Jerome H., 4,463,078, Cl. 430-73.000.

Perrenoud, Blaise, to BBC Brown, Boveri & Company, Limited. Electric power circuit breaker. 4,463,230, Cl. 200-147.00R.

Perryman, Leslie M., to M. L. Shelley & Partners Limited. Thermoforming apparatus. 4,462,786, Cl. 425-388.000.

Person, Thomas C. Heating system. 4,462,542, Cl. 237-19.000.

Pertramer, Siegfried; Adamek, Joachim; and Prade, Ernstfried, to Mistral Windsurfing AG of Grindelstrasse. Mast foot for sail boards. 4,462,327, Cl. 114-90.000.

Pet Incorporated: *See*—
Wells, Harold D., 4,462,307, Cl. 99-386.000.

Peters, Horst: *See*—
Serini, Volker; Peters, Horst; Rudolph, Udo; Buekers, Josef; Nouvertne; and Freitag, Dieter, 4,463,130, Cl. 525-67.000.

Peterson, Edward S.; and Darden, Jerome W., to Texaco Inc. Siloxane stabilizers for inorganic silicates in antifreeze/coolant formulations. 4,462,921, Cl. 252-78.300.

Peterson, J. Leroy: *See*—
Wilson, Robert A.; and Peterson, J. Leroy, 4,462,870, Cl. 202-124.000.

Petrillo, Edward W., Jr.; Gordon, Eric M.; Krapcho, John; and Sprague, Peter W., to E. R. Squibb & Sons, Inc. Carboxyalkyl amino acid derivatives of various substituted prolines. 4,462,943, Cl. 260-112.50R.

Petro-Canada Exploration Inc.: *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.

Petro-Tex Chemical Corporation: *See*—
Manning, Harold E., 4,463,211, Cl. 585-510.000.

Petrofina Canada Inc.: *See*—
Schramm, Laurier L.; and Smith, Russell G., 4,462,892, Cl. 208-11.0LE.

Petrova, Valentina V.: *See*—
Rodkin, Valentin V.; Chudinovsky, Anatoly A.; and Petrova, Valentina V., 4,462,765, Cl. 417-414.000.

Pfaff Industriemaschinen GmbH: *See*—
Mall, Gunther; and Wunstel, Eugen, 4,462,321, Cl. 112-121.150.

Pfeffer, Henry A., III; and Fradkin, Judith N., to Intermountain Research & Development. Method of operating a rotary calciner retrofitted to coal-firing. 4,462,794, Cl. 432-14.000.

Pfefferle, Egon: *See*—
Rafael, Werner; and Pfefferle, Egon, 4,462,637, Cl. 299-32.000.

Pfizer Inc.: *See*—
Jasys, Vytautas J., 4,462,934, Cl. 260-239.100.

Phillips Petroleum Company: *See*—
Aldag, Arthur W., Jr., 4,463,213, Cl. 585-629.000.
Hughes, William B., 4,463,096, Cl. 436-29.000.
Parlman, Robert M.; and Bresson, Clarence R., 4,462,898, Cl. 209-166.000.
Stynes, Peter C., 4,462,966, Cl. 422-220.000.

Phillips, Raymond J., to United States of America, Navy. Convertible termination tip for submarine buoyant cable antenna system. 4,463,358, Cl. 343-709.000.

Phillips, Robert A.: *See*—
Bennett, R. James; and Phillips, Robert A., 4,463,297, Cl. 318-561.000.

Pickens, John O.: *See*—
Hood, Paul E.; and Pickens, John O., 4,463,058, Cl. 75-229.000.

Pigman, John H.: *See*—
Lynch, Thomas J.; and Pigman, John H., 4,462,168, Cl. 33-492.000.

Pilbrow, Malcolm F.: *See*—
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,887, Cl. 204-286.000.
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,888, Cl. 204-286.000.

Pilkington Brothers P.L.C.: *See*—
Hart, Frederick H., 4,462,883, Cl. 204-192.00C.

Pillar Corporation: *See*—
Landis, James P., 4,463,414, Cl. 363-86.000.

Pillon, Dominique B.: *See*—
Albin, Michel; and Pillon, Dominique B., 4,462,955, Cl. 376-272.000.

Pingleton, Robert W.; and Downs, Frank J. Portable television equipment carrier. 4,462,525, Cl. 224-210.000.

Pioneer Electronic Corporation: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,463,394, Cl. 360-96.500.
Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, 4,463,393, Cl. 360-74.100.

Piper, Douglas E., to Woven Electronics Corporation. Woven low impedance electrical transmission cable and method. 4,463,323, Cl. 333-1.000.

Pitel, Ira J., to Cornell-Dubilier Corp. Four lamp modular lighting control. 4,463,287, Cl. 315-291.000.

Pitman, Donald G., to Caretaker Systems, Inc. Rotary indexing nozzle for swimming pools and the like. 4,462,546, Cl. 239-97.000.

Pitts, Warren R., to Dennison Manufacturing Company. Electrosensitive printing technique. 4,463,365, Cl. 346-163.000.

Platforms and Power, Inc.: *See*—
Crudele, Richard E., 4,462,484, Cl. 182-19.000.

Plessey Overseas Limited: *See*—
Hickling, David J., 4,462,142, Cl. 403-329.000.

PLM AB: *See*—
Nilsson, Claes T.; Jakobsen, Kjell M.; and Larson, Lars G., 4,462,950, Cl. 264-292.000.

Pocket Cooler Company: *See*—
Larson, Fred G., 4,462,444, Cl. 150-52.00R.

Poistner, John C. Veneer lathe hold-down rolls. 4,462,442, Cl. 144-213.000.

Poirier, Jacques B. Prefabricated dwelling of the modular type. 4,462,191, Cl. 52-236.100.

Poitrenaud, Pierre: *See*—
Boiron, Pierre; and Poitrenaud, Pierre, 4,462,956, Cl. 376-287.000.

Polaroid Corporation: *See*—
Ferguson, John H.; Norland, Kenneth S.; and Sofen, Stephen R., 4,463,082, Cl. 430-228.000.
Kisler, Semyon, 4,462,528, Cl. 226-120.000.
Kisler, Semyon, 4,463,040, Cl. 427-445.000.

Polit, Neil A., to Xerox Corporation. Rotary inserter. 4,462,199, Cl. 53-266.00A.

Pollman, Frederic W.; Bolinger, Jimmy W.; and Reynolds, David W., to Sundstrand Corporation. Input torque control for a variable displacement hydraulic transmission. 4,462,210, Cl. 60-444.000.

Polya, Kalman: *See*—
Kovacs, Antal; Liptak, Andras; Nanasi, Pal; Janossy, Jorant; Csernus, Istvan; Erdei, Janos; Kaszab, Istvan; Polya, Kalman; and Neszmelyi, Andras, 4,462,993, Cl. 424-180.000.

Polymer Technology Corporation: *See*—
Ellis, Edward J., 4,463,149, Cl. 526-279.000.

Poradowski, Lech M., to Roanwell Corporation. Noise canceling transmitter. 4,463,222, Cl. 179-121.00D.

Porcelli, Filippo: *See*—
Baroncelli, Vittorio; Colapicchioni, Claudio; Giannini, Ivo; and Porcelli, Filippo, 4,463,099, Cl. 436-546.000.

Porta Systems Corp.: *See*—
Fasano, Michael, 4,463,403, Cl. 361-124.000.

Portals Limited: *See*—
Fuller, James S., 4,462,867, Cl. 162-103.000.
Tooth, Alan J.; and Pask, Neil, 4,462,866, Cl. 162-103.000.

Porter, David G.: *See*—
Snowdon, Albert C.; Forsell, Kenneth A.; Theisen, Peter J.; Zarling, Emil W.; and Porter, David G., 4,462,657, Cl. 339-256.00S.

Potash, Hanan; and Green, Howard H., to Burroughs Corporation. Method of transforming high level language statements into multiple lower level language instruction sets. 4,463,423, Cl. 364-300.000.

Powell, Louis D. Hydraulic friction heater. 4,462,386, Cl. 126-247.000.

Powell, Philip G.; and Sharman, Richard A., to Eastman Kodak Company. Image processing apparatus including a partitioned low pass channel. 4,463,381, Cl. 358-166.000.

Powell, William H., Jr.: *See*—
Luartes, Cleto R.; and Powell, William H., Jr., 4,462,708, Cl. 400-304.000.

Power Technologies, Inc.: *See*—
de Mello, F. Paul; Hannett, Louis N.; Parkinson, David W.; and Czuba, John S., 4,463,306, Cl. 322-25.000.

PPG Industries, Inc.: *See*—
DeLue, Norman R.; and Korach, Malcolm, 4,462,876, Cl. 204-59.00R.
Gillery, F. Howard; and Criss, Russell C., 4,462,884, Cl. 204-192.00C.
Wagner, Melvin P.; Tultz, Joseph P.; and Krivak, Thomas G., 4,463,108, Cl. 523-216.000.

Prada, Luis E., to General Electric Company. Door control device with closure regulator. 4,462,437, Cl. 141-360.000.

Prade, Ernstfried: *See*—
Pertramer, Siegfried; Adamek, Joachim; and Prade, Ernstfried, 4,462,327, Cl. 114-90.000.

Prater, Klaus; and Keesen, Heinz, to Bayer Aktiengesellschaft. Thixotropising agents for unsaturated polyester resins. 4,462,926, Cl. 252-315.100.

Precision Metal Fabricators, Inc.: *See*—
Lenhart, Ronald A., 4,462,720, Cl. 406-84.000.

Preisler, Eberhard; Hofmann, Bernhard; and Nolte, Gerhard, to Hoechst Aktiengesellschaft. Process for removing molybdenum from aqueous manganese salt solutions. 4,462,912, Cl. 210-665.000.

Priest, Joseph R.: *See*—
Langowski, Faustyn C.; Berry, Joe R.; and Priest, Joseph R., 4,462,733, Cl. 414-22.000.

Pringle, William L. Method for manufacturing a bearing support collar. 4,462,239, Cl. 72-359.000.

Printronix, Inc.: *See*—
Mayne, David W.; and Jennings, Alan K., 4,463,300, Cl. 318-687.000.

Procter & Gamble Company, The: *See*—
Ahr, Nicholas A.; Louis, Paul R.; Mullane, William I., Jr.; and Ouellette, William R., 4,463,045, Cl. 428-131.000.
Dirksing, Robert S.; and Yeazell, Bruce A., 4,462,121, Cl. 4-228.000.
Strobel, Rudolf G. K., 4,463,025, Cl. 426-599.000.
Yam, Benny S., 4,462,543, Cl. 239-8.000.

Proctor, Ronald A. Supplementary upper brake light. 4,463,411, Cl. 362-61.000.

Propster, Mark A.; and Streicher, William L., to Owens-Corning Fiberglas Corporation. Scrap glass recovery. 4,462,815, Cl. 65-2.000.

Prutec Limited: *See*—
Bassett, Peter J.; and Verheijen, Augustinus W., 4,463,215, Cl. 136-244.000.

Pulsar Corporation: *See*—
Routery, Edward E., 4,462,345, Cl. 123-58.00C.

Purdue Research Foundation: *See*—
Lonergan, Dennis A., 4,462,932, Cl. 260-119.000.

Puybaraud, Guy H., to S.A. Automobiles Citroen; and Societe Automobiles Peugeot. Grinding tool with radially shiftable abrasive bars. 4,462,189, Cl. 51-338.000.

Pyle, Harold W.: *See*—
Short, Robert D., III; Bennett, Clarence L., Jr.; Barnes, Richard M.; Smith, Robert S.; and Pyle, Harold W., 4,463,356, Cl. 343-7.700.

Quadri Corporation: *See*—
Bruder, John F.; and Rainwater, Sam L., 4,463,449, Cl. 365-196.000.

Quality Mat Company: *See*—
Penland, Joe E., Sr., 4,462,712, Cl. 404-36.000.

Rabinovic, I. Samuel: *See*—
Grandzol, Richard J.; McFaull, Albert J.; Wanger, W. Hunter; and Rabinovic, I. Samuel, 4,463,131, Cl. 525-76.000.

Raevsky, Vitaly; and Svechinsky, Gregory, to Raspik Ltd. Fire and heat protection material of ablative type. 4,462,831, Cl. 106-18.260.

Rafael, Werner; and Pfefferle, Egon, to Gewerkschaft Eisenhutte Westfalia. Control apparatus for inclination of longwall guide. 4,462,637, Cl. 299-32.000.
Ragaly, Istvan, to Robert Bosch GmbH. Three-phase alternator with a positive non-flexibly coupled fan wheel. 4,463,275, Cl. 310-78.000.
Rainwater, Sam L.: *See*—
Bruder, John F.; and Rainwater, Sam L., 4,463,449, Cl. 165-196.000.
Ralston Purina Company: *See*—
Kuzara, James H., 4,463,353, Cl. 340-825.540.
Ramanadin; and Seigneurin, Laurent, to Rhone-Poulenc Industries. Process for the preparation of trifluoromethylbenzenes from the corresponding trichloro- or tribromo-methylbenzenes. 4,462,937, Cl. 260-544.00F.
Rambert, AndreLes Fontanelles, 10 bis rue Dr.Bonhomme; and Bousquet, Gilles. Total knee prosthesis. 4,462,120, Cl. 3-1.911.
Rambow, Frederick H. K., to Shell Oil Company. Borehole televiewer display. 4,463,378, Cl. 358-112.000.
Ramsbottom, Lawrence W.: *See*—
Green, David; Stancliffe, Alan D.; Ramsbottom, Lawrence W.; and Thomas, David A., 4,463,109, Cl. 523-333.000.
Rando Machine Corporation: *See*—
Wood, Dennis E., 4,462,140, Cl. 19-105.000.
Rangwala, Badruddin K., to Ex-Cell-O Corporation. Filler means for charging containers. 4,462,436, Cl. 141-250.000.
Raphael, Paul S.: *See*—
Dean, Robert; and Raphael, Paul S., 4,462,513, Cl. 194-100.00A.
Rasilainen, Juhani; and Saarela, Esko, to Lonnstrom Oy. Unloader for a silo or silmilar. 4,462,744, Cl. 414-311.000.
Raspik Ltd.: *See*—
Raevsky, Vitaly; and Svechinsky, Gregory, 4,462,831, Cl. 106-18.260.
Ray, Sudipta K.: *See*—
Bhattacharya, Somnath; Chance, Dudley A.; Koopman, Nicholas G.; and Ray, Sudipta K., 4,463,059, Cl. 428-620.000.
Raychem Corporation: *See*—
Campbell, Bruce D.; and Triplett, James T., 4,462,655, Cl. 339-98.000.
McGaffigan, Thomas H., 4,462,651, Cl. 339-30.000.
Raynes, Edward P., to Secretary of State in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The. Liquid crystal materials and devices. 4,462,924, Cl. 252-299.630.
Raytheon Company: *See*—
Gill, Harry A., Jr., 4,463,271, Cl. 307-350.000.
Razzano, John S.: *See*—
Evans, Edwin R.; and Razzano, John S., 4,463,118, Cl. 524-264.000.
RCA: *See*—
Harford, Jack R., 4,463,369, Cl. 357-44.000.
RCA Corporation: *See*—
Dingwall, Andrew G. F., 4,463,273, Cl. 307-450.000.
Kaplan, Leonard A., 4,463,318, Cl. 330-251.000.
Lewis, Henry G., Jr., 4,463,371, Cl. 358-13.000.
Parker, Robert P., 4,463,385, Cl. 358-242.000.
Stavitsky, David; and Beres, Ernest A., 4,462,780, Cl. 425-144.000.
Whitley, George J., 4,462,435, Cl. 140-105.000.
Whitley, George J., 4,463,310, Cl. 324-73.0PC.
RCA, Inc.: *See*—
McIntyre, Robert J.; and Webb, Paul P., 4,463,368, Cl. 357-30.000.
Reba, Imants, to Crown Zellerbach Corporation. Trim separator. 4,462,722, Cl. 406-154.000.
Red Dot Corporation: *See*—
Hansen, Gary P., 4,462,541, Cl. 237-2.00A.
Redfield, William H.: *See*—
Obermann, George; Kothe, Erich; and Redfield, William H., 4,463,225, Cl. 200-35.00R.
Reed, Robert L., to Standard Oil Company (Indiana). Recovery of elemental sulfur from sour gas. 4,462,977, Cl. 423-574.00R.
Reeves, John F.; and Wahner, Clarence O., to Sprinkmann Sons Corporation. Building panel. 4,463,043, Cl. 428-68.000.
Rehage, Ted A.: *See*—
Bushaw, Kenneth A.; Branson, William I.; Rehage, Ted A.; and Shook, Frankie S., 4,463,417, Cl. 364-200.000.
Reichel, Werner: *See*—
Ballarin, Jurgen; Cieslik, Detlef; and Reichel, Werner, 4,462,645, Cl. 312-214.000.
Reil, Wilhelm, to Tetra Pak Development, S.A. Apparatus for forming liquid filled packages. 4,462,202, Cl. 53-526.000.
Rein, Charles R., to United States of America, Navy. Multiple depth water sampling system. 4,462,265, Cl. 73-863.330.
Rellick, Joseph R., to Du Pont de Nemours, E. I., and Company. Thick film silver metallization composition. 4,462,827, Cl. 106-1.190.
Renault Vehicules Industriels: *See*—
Bonnetain, Yves; and Sibeud, Jean P., 4,463,427, Cl. 364-442.000.
Dazzi, Jean-Louis; and Froment, Jean-Louis, 4,462,369, Cl. 123-450.000.
Renishaw Electrical Limited: *See*—
McMurtry, David R., 4,462,162, Cl. 33-174.00L.
REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,462,648, Cl. 339-3.00S.
Reppert, Rudi; and Zaunberger, Franz X., to Zahnraderfabrik Renk A.G. Shiftable planetary gear train. 4,462,274, Cl. 74-781.00R.
Research Corporation: *See*—
Agrawal, Krishna C.; and Sakaguchi, Masakazu, 4,462,992, Cl. 424-180.000.
Retech, Inc.: *See*—
Schlienger, Max P.; and Szeto, Whalun, 4,463,242, Cl. 219-69.00V.
Rexer, Felix A. Valve arrangement. 4,462,426, Cl. 137-625.630.
Rexnord Inc.: *See*—
Yamamoto, Albert K., 4,462,240, Cl. 72-391.000.
Reyes, Daniel W.: *See*—
Alves, Roger J.; and Reyes, Daniel W., 4,462,564, Cl. 248-27.100.
Reynolds, David W.: *See*—
Pollman, Frederic W.; Bolinger, Jimmy W.; and Reynolds, David W., 4,462,210, Cl. 60-444.000.
Rhodes, Delmer R.: *See*—
McGary, Charles W., Jr.; Pascarella, Vincent J.; Rhodes, Delmer R.; and Taller, Robert A., 4,463,156, Cl. 528-65.000.
Rhodes, Harold A.: *See*—
Dille, Roger M.; Rhodes, Harold A.; and Wallon, Susan B., 4,462,928, Cl. 252-373.000.
Rhone-Poulenc Industries: *See*—
Chabardes, Pierre; and Kuntz, Emile, 4,463,196, Cl. 568-450.000.
Ramanadin; and Seigneurin, Laurent, 4,462,937, Cl. 260-544.00F.
Riaudet, Jean-Claude L.: *See*—
Crochet, Michel H.; and Riaudet, Jean-Claude L., 4,463,309, Cl. 324-57.00R.
Riblet, Gordon P.; and Riblet, Henry G. Stub-supported coaxial power divider having dissipation resistor buried in center conductor. 4,463,325, Cl. 333-127.000.
Riblet, Henry G.: *See*—
Riblet, Gordon P.; and Riblet, Henry G., 4,463,325, Cl. 333-127.000.
Richards, Robert E., to J. A. Richards Company. Tool support for machines. 4,462,243, Cl. 72-481.000.
Richter, Virgil J.: *See*—
Gangwisch, William J.; Richter, Virgil J.; Wixon, Harold E.; and Wraga, Joseph B., 4,462,804, Cl. 8-137.000.
Rickards, Field W., to University of Melbourne, The. Evoked response audiometer. 4,462,411, Cl. 128-746.000.
Ricoh Company, Ltd.: *See*—
Shimura, Akira; and Takashi, Yokota, 4,462,676, Cl. 355-3.0BE.
Rider, Billie F., to Rockwell International Corporation. Sensor assembly having means for cancellation of harmonic induced bias from a two-axis linear accelerometer. 4,462,254, Cl. 73-510.000.
Rife, Jack C.: *See*—
Kabler, Milton N.; Williams, Richard T.; Rife, Jack C.; Hunter, William R.; Kirkland, Johnny P.; and Lien, Neil C., 4,462,689, Cl. 356-333.000.
Rinehart, Michael K.: *See*—
Dalton, William O.; Rinehart, Michael K.; and Sugio, Akitoshi, 4,463,164, Cl. 528-212.000.
Ringer, Richard M., to Armstrong World Industries, Inc. Transfer printing floor tile. 4,462,853, Cl. 156-238.000.
Ringwald, Peter, to Robert Bosch GmbH. Pump, especially for pumping fuel from a storage tank to an internal combustion engine. 4,462,761, Cl. 417-203.000.
Ripper, Wolfgang; Straubel, Max; and Wessel, Wolf, to Robert Bosch GmbH. Method and apparatus for determining and controlling the exhaust gas recirculation rate in internal combustion engines. 4,462,376, Cl. 123-571.000.
Rissanen, Jorma J.: *See*—
Langdon, Glen G., Jr.; and Rissanen, Jorma J., 4,463,342, Cl. 340-347.0DD.
Rissman, Paul: *See*—
Owen, Geraint; and Rissman, Paul, 4,463,265, Cl. 250-492.200.
Ritten, Robert G.: *See*—
Terry, John L.; and Ritten, Robert G., 4,462,485, Cl. 182-84.000.
Roanwell Corporation: *See*—
Poradowski, Lech M., 4,463,222, Cl. 179-121.00D.
Robar, James D. J.: *See*—
Okkerse, Simon W. J. H.; Friesen, Robert J.; and Robar, James D. J., 4,463,345, Cl. 340-505.000.
Robert Bosch GmbH: *See*—
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,462,362, Cl. 123-425.000.
Brammer, Hartmut; and Kaiser, Harry, 4,462,347, Cl. 123-146.50A.
Hirt, Adam, 4,462,356, Cl. 123-335.000.
Hornung, Friedrich; Jundt, Wolfgang; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,463,293, Cl. 318-284.000.
Karle, Anton; and Laufer, Helmut, 4,462,361, Cl. 123-357.000.
Leiber, Heinz, 4,462,642, Cl. 303-119.000.
Mohl, Helmut; Schwab, Manfred; Sauer, Joseph; Muller, Alfred; Leiber, Heinz; and Czinczel, Armin, 4,462,275, Cl. 74-866.000.
Ragaly, Istvan, 4,463,275, Cl. 310-78.000.
Ringwald, Peter, 4,462,761, Cl. 417-203.000.
Ripper, Wolfgang; Straubel, Max; and Wessel, Wolf, 4,462,376, Cl. 123-571.000.
Sumal, Jaihind S., 4,462,251, Cl. 73-118.000.
Robertshaw Controls Company: *See*—
Gesbauffe, Francis S.; Erdelsky, Joseph J.; and Shopsky, Harvey J., 4,462,424, Cl. 137-613.000.
Robertson, David A.; and Turner, Norman L., to Varian Associates, Inc. Apparatus for enhanced neutralization of positively charged ion beam. 4,463,255, Cl. 250-251.000.
Robinson, Allan J.; and Smith, William T., to Goodyear Tire & Rubber Company, The. Adapter for a tire bead loosening tool. 4,462,450, Cl. 157-1.000.
Robinson, Hugh A.: *See*—
Wenstrom, Roger A.; Irvin, Donald E.; MacKay, George L.; and Robinson, Hugh A., 4,462,854, Cl. 156-250.000.

Robinson, Ivan M., to Du Pont de Nemours, E. I., and Company. Polyether carbonate diols and polyurethanes prepared therefrom. 4,463,141, Cl. 525-467.000.
Robinson, Jack R.: *See*—
Dumont, Kenneth R.; and Robinson, Jack R., 4,462,526, Cl. 225-4.000.
Robinson, Martin A.: *See*—
Van Der Puy, Michael; Gatrone, Ralph C.; Robinson, Martin A.; and Hendrickson, Larry L., 4,462,819, Cl. 71-28.000.
Rockwell International Corporation: *See*—
Bain, Lawrence J.; Eckerson, Robert D.; and Siniscal, Paul D., 4,462,735, Cl. 414-37.000.
Dawson, Sylvan L., 4,463,320, Cl. 330-279.000.
Hemond, Harold C.; and Ezell, William H., 4,463,454, Cl. 367-173.000.
Holmstrom, Roy C., 4,462,639, Cl. 301-37.0SC.
Iannucci, Vincent A., 4,462,552, Cl. 242-42.000.
Rider, Billie F., 4,462,254, Cl. 73-510.000.
Roper, Daniel W., 4,462,272, Cl. 74-711.000.
Schultz, Elmer L.; and Fredrickson, Lee R., 4,463,355, Cl. 340-971.000.
Rockwell-Rimoldi S.p.A.: *See*—
Motta, Bruno; and Nava, Erminio, 4,462,325, Cl. 112-315.000.
Perego, Giuseppe; and Garagiola, Adelmo, 4,462,326, Cl. 112-318.000.
Rodkin, Valentin V.; Chudinovsky, Anatoly A.; and Petrova, Valentina V. Liquid-proofing system for an electric motor of a deep-well pumping unit. 4,462,765, Cl. 417-414.000.
Rodriguez-Rosell, Juan A.: *See*—
Mattson, Richard L.; and Rodriguez-Rosell, Juan A., 4,463,424, Cl. 364-300.000.
Roeschlaub, John G.: *See*—
McKinley, John R.; and Roeschlaub, John G., 4,462,495, Cl. 209-3.300.
Rogak, Michael; Witbeck, Charles; Golan, Leonard W.; and Golan, Stephen L., to Hawk Industries, Inc. Chamber alignment and safety system for a firearms. 4,462,179, Cl. 42-1.00Q.
Rohde, Siegfried: *See*—
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,462,362, Cl. 123-425.000.
Rohling, Leon J.: *See*—
Brown, Harold D.; Rohling, Leon J.; and Brown, Mark A., 4,462,464, Cl. 166-68.500.
Rohm Company Limited: *See*—
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Rohm GmbH: *See*—
Arndt, Peter J.; Siol, Werner; Ludwig, Walter; and Wenzel, Franz, 4,463,032, Cl. 427-222.000.
Besecke, Siegmund; Schroeder, Guenter; Ude, Werner; and Wunderlich, Winfried, 4,463,159, Cl. 528-167.000.
Rohm and Haas Company: *See*—
Grandzol, Richard J.; McFaull, Albert J.; Wanger, W. Hunter; and Rabinovic, I. Samuel, 4,463,131, Cl. 525-76.000.
Kelley, Everett J., 4,463,150, Cl. 526-292.400.
Rolfs, John C., to Sperry Corporation. Miniature coaxial line to waveguide transition. 4,463,324, Cl. 333-26.000.
Rolls-Royce Limited: *See*—
Hitchcock, Malcolm C., 4,462,207, Cl. 60-204.000.
McMurtry, David R., 4,462,162, Cl. 33-174.00L.
Muggleworth, Simon D.; and Sparrow, Colin G., 4,462,756, Cl. 416-215.000.
Schofield, Peter R., 4,462,754, Cl. 416-97.00R.
Romanick, John F.: *See*—
Perlinski, Witold; Davis, Irwin J.; and Romanick, John F., 4,463,110, Cl. 523-409.000.
Romberg, Harvey D., to Sherwood Systems, Inc. Apparatus for unloading silo. 4,462,743, Cl. 414-306.000.
Romberger, Mark W. Safety tag holder. 4,462,175, Cl. 40-10.00R.
Roper, Daniel W., to Rockwell International Corporation. Limited slip differential. 4,462,272, Cl. 74-711.000.
Roper, Jerry M.: *See*—
Everly, Charles R.; and Roper, Jerry M., 4,463,186, Cl. 560-82.000.
Everly, Charles R.; and Roper, Jerry M., 4,463,187, Cl. 560-82.000.
Rose, Byron W.: *See*—
Hutchison, Herbert L.; and Rose, Byron W., 4,463,046, Cl. 428-156.000.
Rose, Douglas N.: *See*—
Gerhart, Grant R.; and Rose, Douglas N., 4,462,257, Cl. 73-644.000.
Rosin, Michael L.: *See*—
O'Connor, James M.; Lickei, Donald L.; and Rosin, Michael L., 4,463,158, Cl. 528-75.000.
Ross, Oakley G.; and Wedertz, Larry D., to General Dynamics, Pomona Division. High pressure electrical insulator. 4,462,421, Cl. 137-542.000.
Rotelec Societe Anonyme: *See*—
Ruer, Jacques, 4,462,458, Cl. 164-504.000.
Roth, Donald J.; Kubis, Charles S.; and Walter, John, to Continental Packaging Company, Inc. Tamper-indicating closure. 4,462,504, Cl. 220-214.000.
Roth, Jean-Luc; and Sierpinski, Herve, to Institut de Recherches de la Sigerurgie Francaise. Reheating metal bodies with recovered blast-furnace energy. 4,462,792, Cl. 432-11.000.
Rothweiler, Richard C.: *See*—
Boozer, James M.; Franks, Terry E.; and Rothweiler. Richard C., 4,463,398, Cl. 361-1.000.
Roullet, Alain, to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude. Apparatus for cooling bulk products. 4,462,221, Cl. 62-381.000.
Roulston, James B.: *See*—
Webster, Peter-John; and Roulston, James B., 4,463,259, Cl. 250-338.000.
Routery, Edward E., to Pulsar Corporation. Energy transfer device utilizing driveshaft having continuously variable inclined track. 4,462,345, Cl. 123-58.00C.
Rovinsky, William Z.; and Frucht, Isaac. Split nut assembly. 4,462,731, Cl. 411-433.000.
Roy, Armand E. Shut height measuring device. 4,462,161, Cl. 33-147.00R.
Rubel, Frederick, Jr.: *See*—
Hager, Donald G.; Massey, Michael L.; and Rubel, Frederick, Jr., 4,462,904, Cl. 210-177.000.
Ruch, Jean; Katryniok, Detlef; Pack, Hugo; and Tillmann, Heinz-Gunther, to Accumulatorenwerke Hoppecke Carl Zoellner & Sohn GmbH & Co. KG. Galvanic element, especially metal-air-cell. 4,463,064, Cl. 429-27.000.
Rudd, Thomas H., to Drag Specialties, Inc. Face shield and helmet. 4,462,119, Cl. 2-424.000.
Rudolph, Udo: *See*—
Serini, Volker; Peters, Horst; Rudolph, Udo; Buekers, Josef; Nouvertne; and Freitag, Dieter, 4,463,130, Cl. 525-67.000.
Ruer, Jacques, to Rotelec Societe Anonyme. Electromagnetic inductor with a rotating field and apparatus for the continuous casting of metal for its use. 4,462,458, Cl. 164-504.000.
Ruhl, Erich; and Thenner, Johann, to Ruhl, Erich. Non-flammable rigid foam and its use as a building material. 4,463,106, Cl. 521-103.000.
Ruhle, Frank S., to Farrand Industries, Inc. Transformer-type position transducer. 4,463,333, Cl. 336-115.000.
Ruip, Terrence M.: *See*—
Siefert, George J.; Kolowski, Michael A.; Lynch, John E.; Ruip, Terrence M.; and Gresens, Henry L., 4,462,447, Cl. 152-353.00C.
Russell, Burdsall & Ward Corporation: *See*—
Zils, James A., 4,462,281, Cl. 81-56.000.
Russell, David B., to Dennison Manufacturing Company. Apparatus for continuous molding. 4,462,784, Cl. 425-223.000.
Rutter, Jerry L.; and Ahle, James L., to Gulf Oil Corporation. Substituted thioesemicarbazides, their manufacture and use as plant growth regulants. 4,462,821, Cl. 71-99.000.
Rutzel, Alois E.; and Rutzel, Stefan. Beverage sipper. 4,462,544, Cl. 239-33.000.
Rutzel, Stefan: *See*—
Rutzel, Alois E.; and Rutzel, Stefan, 4,462,544, Cl. 239-33.000.
Ryan, James M.: *See*—
Holmes, Arthur S.; and Ryan, James M., 4,462,814, Cl. 62-17.000.
S&C Electric Company: *See*—
Dizon, Edmund S.; and Mosinski, Joseph P., Jr., 4,463,227, Cl. 200-50.00A.
S.N.E.C.M.A.: *See*—
Silhouette, Jean-Max M., 4,462,902, Cl. 210-107.000.
Saarela, Esko: *See*—
Rasilainen, Juhani; and Saarela, Esko, 4,462,744, Cl. 414-311.000.
Sabacky, Bruce J.; and Hepworth, Malcolm T., to Amax Inc. Molybdenum dioxide-molybdenite roasting. 4,462,822, Cl. 75-7.000.
Sabia, Angelo J.: *See*—
Totten, George E.; and Sabia, Angelo J., 4,463,036, Cl. 427-389.900.
Safe T Jack, Inc.: *See*—
Arzouman, Harry H., 4,462,569, Cl. 254-8.00B.
Safety-Kleen Corporation: *See*—
Otzen, Karl G., 4,462,415, Cl. 134-111.000.
Safier, Robert S.: *See*—
D'Alessio, Michael S.; and Safier, Robert S., 4,462,197, Cl. 52-637.000.
Sagae, Michio: *See*—
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Sagami Chemical Research Center: *See*—
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Saida, Hiroji: *See*—
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Saito, Seiji: *See*—
Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,463,361, Cl. 346-134.000.
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, to Yoshino Kogyosho Co., Ltd. Manual type miniature atomizer. 4,462,549, Cl. 239-333.000.
Saito, Takehide; and Nakagawa, Yasuo, to Sumitomo Bakelite Company, Limited. Ferromagnetic resin composition containing polymeric surface precoated magnetic rare earth cobalt powders. 4,462,919, Cl. 252-62.540.
Saito, Tetsuo; and Ema, Sumio, to Tokico Ltd. Vehicle height adjusting apparatus. 4,462,610, Cl. 280-707.000.
Sajo, Agnes: *See*—
Sajo, Geza J.; and Sajo, Agnes, 4,462,432, Cl. 139-33.000.
Sajo, Geza J.; and Sajo, Agnes, to Masterweaver (1982) Ltd. Hand weaving machine. 4,462,432, Cl. 139-33.000.
Sakagami, Shigeru: *See*—
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Sakaguchi, Masakazu: *See*—
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Sakaguchi, Shouzaburou: *See*—
Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, 4,463,393, Cl. 360-74.100.
Sakai, Kozi: *See*—
Sugimoto, Shigeo; Minowa, Ryohei; and Sakai, Kozi, 4,462,222, Cl. 62-476.000.
Sakai, Masaaki: *See*—
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Sakakibara, Mitsuhiko: *See*—
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Sakakibara, Mizuo: *See*—
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Sakamoto, Yoshihiro: *See*—
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Sakane, Kazuo: *See*—
Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, 4,463,000, Cl. 424-246.000.
Sakao, Nobuo: *See*—
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Sakata, Gojyo; Numata, Tatsuo; Kusano, Kazuya; Hirose, Masayoshi; and Hirata, Kiminori, to Nissan Chemical Industries, Inc. N-Containing heterocyclic ring-substituted O-arylphosphate derivatives, preparation thereof, and insecticides, acaricides and nematocides containing said derivatives. 4,462,994, Cl. 424-200.000.
Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Sakurai, Masaki; Yusa, Yahuhiro; and Yoshihara, Kenji, 4,463,388, Cl. 358-342.000.
Sakuyama, Masaki: *See*—
Okamoto, Kouichi; Oishi, Norio; Sakuyama, Masaki; Nomura, Tatsuei; Yamada, Tadatoshi; and Iwamoto, Masatami, 4,462,152, Cl. 29-598.000.
Salvadori, Paolo: *See*—
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Samal, Prasanna K.: *See*—
Klar, Erhard; Nadkarni, Anil V.; and Samal, Prasanna K., 4,462,845, Cl. 148-13.200.
Samejima, Masayoshi; Hirata, Goichi; Koida, Yoshiyuki; Kobayashi, Yoshinori; and Kida, Akira, to Tanabe Seiyaku Co., Ltd. Microcapsules and method of preparing same. 4,462,982, Cl. 424-35.000.
Samhaber, Friedrich, to Andritz-Ruthner Industrieanlagen Aktiengesellschaft. Detoxification or decontamination of effluents and/or flue gases. 4,462,911, Cl. 210-638.000.
Sanders, Winfred J., to SmithKline Beckman Corporation. Dialkyl 1-(2-pyridinylthio)-1,2-hydrazinedicarboxylate, N-oxides and their use as animal growth stimulants. 4,463,009, Cl. 424-263.000.
Sanderson, John R.: *See*—
Krishnan, Sivaram; and Sanderson, John R., 4,463,163, Cl. 528-196.000.
Sandoz Ltd.: *See*—
Azria, Moise; and Cavanak, Thomas, 4,462,983, Cl. 424-45.000.
Littlewood, Peter S., 4,462,925, Cl. 252-301.280.
Sanford, Howard R. Cleaning and abrasive scrubbers and method for their preparation. 4,462,135, Cl. 15-105.000.
Sankey, Bruce M.: *See*—
Biceroglu, Omer; and Sankey, Bruce M., 4,462,895, Cl. 208-59.000.
Sankro Sportsline Products, Inc.: *See*—
Sanzone, Salvatore J.; and Krout, Donald, 4,462,116, Cl. 2-170.000.
Sanraku-Ocean Co., Ltd.: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Tatsuta, Kuniaki; Ishikura, Tomoyuki; Okamoto, Rokuro; Yamamoto, Masao; and Kiyoshima, Kohki, 4,463,171, Cl. 536-7.100.
Sanyo-Kokusaku Pulp Co., Ltd.: *See*—
Nishijima, Masayuki; Koizumi, Morimasa; and Matsuda, Minoru, 4,463,029, Cl. 427-209.000.
Sanzone, Salvatore J.; and Krout, Donald, to Sankro Sportsline Products, Inc. Athletic sweatband. 4,462,116, Cl. 2-170.000.
Sappsucker, Inc.: *See*—
May, Ronald L.; and Sinclair, Bobby W., 4,462,813, Cl. 62-17.000.
Sarbach, Jurg: *See*—
Cahannes, Paul; Daume, Eduard; and Sarbach, Jurg, 4,462,312, Cl. 102-364.000.
Sargent, Charles L.: *See*—
Antos, John M.; Lapham, Richard G.; Sargent, Charles L.; and Sargent, Frank T., 4,462,124, Cl. 4-346.000.
Sargent, Frank T.: *See*—
Antos, John M.; Lapham, Richard G.; Sargent, Charles L.; and Sargent, Frank T., 4,462,124, Cl. 4-346.000.
Sargent & Greenleaf, Inc.: *See*—
Evans, Walter R., 4,462,230, Cl. 70-383.000.
Sarich, Tony R.; Johnsen, Kenneth N.; and McKay, Michael L., to Orbital Engine Company Proprietary Limited. Method and apparatus for metering liquids. 4,462,760, Cl. 417-54.000.
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,463,086, Cl. 430-553.000.
Satake, Eishin, to Tsudakoma Kogyo Kabushiki Kaisha. Tilting rotary table device. 4,462,579, Cl. 269-61.000.
Sato, Isao; and Nakajima, Kosaku, to Toshiba Heating Appliances Co., Ltd. Radiation base of an electric appliance. 4,462,173, Cl. 38-93.000.
Sato, Kenichi, to Sumitomo Electric Industries, Ltd. Compound cable. 4,463,219, Cl. 174-127.000.
Sato, Kozo: *See*—
Naito, Hideki; Hara, Hiroshi; and Sato, Kozo, 4,463,079, Cl. 430-203.000.
Sato, Susumu: *See*—
Okuhara, Akira; Kotaka, Yasuyosi; Nishio, Masakazu; Sato, Susumu; Watanabe, Isamu; and Inoue, Masaru, 4,463,019, Cl. 426-17.000.
Satoh, Hiroshi: *See*—
Yamanoi, Masaru; and Satoh, Hiroshi, 4,463,223, Cl. 179-156.00R.
Satran, Amir; and Brasey, Andre, to Iscar Ltd. Metal cutting tools with replacement insert. 4,462,725, Cl. 407-92.000.
Satterwhite, William A., to CF Industries, Inc. Method for producing fertilizer-grade phosphoric acid. 4,462,972, Cl. 423-320.000.
Sauer, Joseph: *See*—
Mohl, Helmut; Schwab, Manfred; Sauer, Joseph; Muller, Alfred; Leiber, Heinz; and Czinczel, Armin, 4,462,275, Cl. 74-866.000.
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Draksliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Russi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., to Iso "METALURGKOMPLEKT". Method of treating and refining liquid metal alloys by direct current electric arc heating. 4,462,878, Cl. 204-140.000.
Schack, Carl J.; Wilson, William W.; and Christe, Karl O., to United States of America, Air Force. Synthesis of pentafluorotellurium hypofluorite. 4,462,975, Cl. 423-473.000.
Schadlich, Fritz: *See*—
Hornung, Friedrich; Jundt, Wolfgang; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,463,293, Cl. 318-284.000.
Schadt, Martin: *See*—
Boller, Arthur; Schadt, Martin; and Villiger, Alois, 4,462,923, Cl. 252-299.610.
Schaedlich, Gunther: *See*—
Moraw, Roland; and Schaedlich, Gunther, 4,462,675, Cl. 355-3.00R.
Schafer, Horst: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 4,463,148, Cl. 526-264.000.
Schenck, Arthur J.; Hoffman, John P.; and Crossley, Glenn R., to Bethlehem Steel Corp. Furnace burden thermographic method and apparatus. 4,463,437, Cl. 364-557.000.
Schenck, Robert A.: *See*—
Bromley, Eric; and Schenck, Robert A., 4,462,594, Cl. 273-85.00G.
Schibbye, (Lars) Lauritz B.; and Englund, Rolf A., to Sullair Technology AB. Method at an oil-injected screw-compressor. 4,462,769, Cl. 418-1.000.
Schick, John W.; and Gemmill, Robert M., Jr., to Mobil Oil Corporation. Process for making synthetic lubricating oils. 4,463,201, Cl. 585-10.000.
Schildkraut, Alan L.: *See*—
Werth, Dee A.; and Schildkraut, Alan L., 4,462,652, Cl. 339-89.00M.
Schiller, Johann: *See*—
Mucke, Rainer; and Schiller, Johann, 4,463,119, Cl. 524-269.000.
Schilling, Peter; and Schreuders, Hans G., to Westvaco Corporation. Mixing of asphalt emulsion and aggregate in aqueous bituminous emulsion-aggregate slurries. 4,462,840, Cl. 106-277.000.
Schippers, Jan: *See*—
Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, 4,463,140, Cl. 525-438.000.
Schlecker, Rainer; Friedrich, Ludwig; and Lenke, Dieter, to BASF Aktiengesellschaft. Triazoloquinazolinones, and compositions and methods for treating allergic disorders with them. 4,463,007, Cl. 424-251.000.
Schlienger, Max P.; and Szeto, Whalun, to Retech, Inc. High speed electric arc saw and method of operating same. 4,463,242, Cl. 219-69.00V.
Schlotterbeck, Stephen C.; Uhland, Francis L., Jr.; Campbell, Willis R.; and Freimuth, John H., to Sperry Corporation. Sprocket-shaped member for supporting apron tubes in roll baling machine. 4,462,203, Cl. 56-341.000.
Schmeling, William H.; and Jurek, Dennis J., to Square D Company. Air core type current pulse and power factor monitoring and control system for a resistance welding apparatus. 4,463,244, Cl. 219-110.000.
Schmidlin, Hans, to Eltreva AG. Device for air control of an energy facade wall. 4,462,459, Cl. 165-54.000.
Schmidt, Volker. Material cutting apparatus for cutting segments having pointed ends from a strip of material. 4,462,289, Cl. 83-217.000.
Schmidt, Werner; and Watzek, Gerhard, to Maschinenfabrik Augsburg-Nurnberg. Apparatus for locating and securing an object at end positions between which the object is movable back and forth. 4,462,127, Cl. 5-118.000.
Schmitz, Wolfgang. Appliance for the partial dyeing of hair. 4,462,413, Cl. 132-113.000.

Schnurbusch, Horst: *See*—
Disteldorf, Josef; Gras, Rainer; Schnurbusch, Horst; Hubel, Werner; and Wolf, Elmar, 4,463,154, Cl. 528-45.000.
Schofield, Peter R., to Rolls Royce Limited. Turbine blade for gas turbine engine. 4,462,754, Cl. 416-97.00R.
Scholl, Hans, to Kochs Adler AG. Workholder for an automatic sewing machine. 4,462,320, Cl. 112-104.000.
Schomburg, Robert R.: *See*—
Goddard, Robert D.; Schomburg, Robert R.; and Wohler, Wayne L., 4,463,386, Cl. 358-261.000.
Schoolcraft, Jim: *See*—
Crocker, Roger A.; and Schoolcraft, Jim, 4,462,749, Cl. 414-748.000.
Schovee, John R. Article for forming a picture frame. 4,462,176, Cl. 40-154.000.
Schramm, Herbert: *See*—
Bonitz, Jorg; Entenmann, Robert; Knab, Rochus; Rohde, Siegfried; and Schramm, Herbert, 4,462,362, Cl. 123-425.000.
Schramm, Laurier L.; and Smith, Russell G., to Petro-Canada Exploration Inc.; Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy and Natural Resources (Alberta Oil Sands Equity); PanCanadian Petroleum Limited; Esso Resources Canada Limited; Canada-Cities Service, Ltd.; Gulf Canada Limited; Alberta Energy Company Ltd.; Hudson's Bay Oil and Gas Company Limited; and Petrofina Canada Inc. Control of process aid used in hot water process for extraction of bitumen from tar sand. 4,462,892, Cl. 208-11.0LE.
Schreuders, Hans G.: *See*—
Schilling, Peter; and Schreuders, Hans G., 4,462,840, Cl. 106-277.000.
Schroeder, Guenter: *See*—
Besecke, Siegmund; Schroeder, Guenter; Ude, Werner; and Wunderlich, Winfried, 4,463,159, Cl. 528-167.000.
Schuller, James T., to UMC Industries, Inc. Change making system. 4,462,512, Cl. 194-1.00N.
Schultz, Edwin R., to United States of America, Air Force. Self-deploying afterbody apparatus for an ejection seat. 4,462,562, Cl. 244-122.00A.
Schultz, Elmer L.; and Fredrickson, Lee R., to Rockwell International Corporation. Solid state mach/air speed indicator. 4,463,355, Cl. 340-971.000.
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, to Exxon Research and Engineering Co. Process for the formation of novel acrylamide acrylate copolymers. 4,463,151, Cl. 526-307.500.
Schulz, Donald N.; Maurer, John J.; and Bock, Jan, to Exxon Research and Engineering Co. Acrylamide acrylate copolymers. 4,463,152, Cl. 526-307.500.
Schulz, Jurgen. Punching or pressing machine. 4,462,291, Cl. 83-368.000.
Schulze, Herbert C. Method of making a portable and collapsed structure. 4,462,145, Cl. 29-428.000.
Schumaker, John W., to AT&T Technologies, Inc. Signal amplitude indicating apparatus. 4,463,431, Cl. 364-480.000.
Schutz, Rudolph W.: *See*—
Wein, Rudolf R.; and Schutz, Rudolph W., 4,462,287, Cl. 83-104.000.
Schwab, Manfred: *See*—
Mohl, Helmut; Schwab, Manfred; Sauer, Joseph; Muller, Alfred; Leiber, Heinz; and Czinczel, Armin, 4,462,275, Cl. 74-866.000.
Schwabe, Ulrich, to Siemens Aktiengesellschaft. Method for producing integrated MOS field effect transistors with an additional track level of metal silicides. 4,462,149, Cl. 29-571.000.
Schwarz, Theodor; Freyer, Karl; and Theilmann, Manfred, to Vormals Jetter & Scheerer Aesculap-Werke Aktiengesellschaft. Forceps- or tweezers-shaped surgical instrument. 4,462,404, Cl. 128-321.000.
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, to Xerox Corporation. Optical scanner. 4,462,658, Cl. 350-96.140.
SCM Corporation: *See*—
Ho, Tse-Lok, 4,463,194, Cl. 568-343.000.
Klar, Erhard; Nadkarni, Anil V.; and Samal, Prasanna K., 4,462,845, Cl. 148-13.200.
Scott, Bentley N.; and Brehm, Gailon E., to Texas Instruments Incorporated. Self-biasing for FET-driven microwave VCOs. 4,463,322, Cl. 331-117.00D.
Scott, Kenneth. Bait container. 4,462,180, Cl. 43-57.000.
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Takata, Akihiko; and Hasegawa, Yoshihiko, 4,462,517, Cl. 198-451.000.
Scrimshire, Hershell D.: *See*—
McCorkle, Kenneth C.; Wells, Horace M.; Scrimshire, Hershell D.; and Beckwith, Robert N., 4,463,023, Cl. 426-270.000.
Sears, Lawrence M. Apparatus for communicating utility usage related information from a utility usage location to a portable utility usage registering device. 4,463,354, Cl. 340-870.020.
Sebulsky, Raynor T.: *See*—
Onopchenko, Judith B.; Singerman, Gary M.; and Sebulsky, Raynor T., 4,462,935, Cl. 260-429.700.
Secretary of State in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The: *See*—
Raynes, Edward P., 4,462,924, Cl. 252-299.630.
Secrist, Duane R.: *See*—
Landon, Thomas E.; Secrist, Duane R.; and Clark, James M., 4,462,889, Cl. 204-292.000.
SED Systems Inc.: *See*—
Okkerse, Simon W. J. H.; Friesen, Robert J.; and Robar, James D. J., 4,463,345, Cl. 340-505.000.
Seigneurin, Laurent: *See*—
Ramanadin; and Seigneurin, Laurent, 4,462,937, Cl. 260-544.00F.
Seiko Instruments & Electronics Ltd.: *See*—
Suzuki, Keiichi, 4,463,218, Cl. 174-68.500.
Seikosha Co., Ltd.: *See*—
Hayashi, Mikio; and Mizutani, Seiki, 4,462,705, Cl. 400-121.000.
Seiter, George M.: *See*—
Gould, Richard J.; and Seiter, George M., 4,462,245, Cl. 73-7.000.
Seitz, Alan F., to Data Motion, Incorporated. Paper feed tractor with belt tensioning. 4,462,531, Cl. 226-171.000.
Seki & Company, Ltd.: *See*—
Yoneyama, Tsukasa, 4,463,330, Cl. 333-239.000.
Seki, Mitsuaki: *See*—
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 4,463,359, Cl. 346-1.100.
Sekiguchi, Kiyonori: *See*—
Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; and Idogaki, Takaharu, 4,462,377, Cl. 123-571.000.
Sekiya, Akio. Dental root marking and measuring instrument for endodontic surgery. 4,462,802, Cl. 433-72.000.
Sekizawa, Kazuhiko: *See*—
Ichikawa, Masaru; Shikakura, Kohichi; Sekizawa, Kazuhiko; and Tanaka, Kazuaki, 4,463,105, Cl. 518-716.000.
Seko, Yasutoshi; and Yanagishima, Takayuki, to Nissan Motor Company, Limited. Drowsiness alarm system for a vehicle. 4,463,347, Cl. 340-576.000.
Sendzimir, Michael G.: *See*—
Turley, John W.; and Sendzimir, Michael G., 4,462,236, Cl. 72-242.000.
Senko, Steve M.: *See*—
Hicks, Robert H.; Senko, Steve M.; Budenaers, Roland J.; and Teno, Richard L., 4,462,208, Cl. 60-286.000.
Sentinel Manufacturing Co., Inc.: *See*—
Mills, J. T., 4,462,352, Cl. 123-198.0DB.
Serini, Volker; Peters, Horst; Rudolph, Udo; Buekers, Josef; Nouvertne; and Freitag, Dieter, to Bayer Aktiengesellschaft. Flame-resistant polymer mixtures. 4,463,130, Cl. 525-67.000.
Serizawa, Hiroshi: *See*—
Nanjyo, Hirotoshi; Serizawa, Hiroshi; and Sagae, Michio, 4,462,363, Cl. 123-427.000.
Seshimoto, Osamu: *See*—
Kitajima, Masao; Seshimoto, Osamu; Namiki, Tomizo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Mizobuchi, Yuzo, 4,463,083, Cl. 430-273.000.
Seto, Tadao: *See*—
Tokunaga, Yukio; Ikeda, Yasuhisa; Seto, Tadao; and Shimazaki, Yoshikazu, 4,463,034, Cl. 427-256.000.
Seufert, Walter; Loeffler, Hans-Peter; and Adolphi, Heinrich, to BASF Aktiengesellschaft. 3-Fluorophenyl (di)thiophosphates, and their use for controlling pests. 4,462,997, Cl. 424-217.000.
Shacklette, Lawrence W.; Miller, Granville G.; and Frommer, Jane E., to Allied Corporation. Solution of a chalcogen-containing polymer in acids and process of forming polymer articles therefrom. 4,462,929, Cl. 252-518.000.
Shacklette, Lawrence W.: *See*—
Gifford, Paul R.; Shacklette, Lawrence W.; Toth, James E.; and Wolf, James F., 4,463,071, Cl. 429-194.000.
Gifford, Paul R.; Palmisano, James B.; Shacklette, Lawrence W.; Chance, Ronald R.; and Toth, James E., 4,463,072, Cl. 429-194.000.
Shah, Ashish: *See*—
DeVale, Donald P.; Wilbrandt, Howard B.; Tomlinson, Dennis E.; and Shah, Ashish, 4,463,429, Cl. 364-466.000.
Shah, Hasmukh R.; and Gupta, Ashok K., to U.M.C. Industries, Inc. Control device. 4,463,446, Cl. 364-900.000.
Shah, Kishore R., to Kendall Company, The. Composite hydrogel-forming lens and method of making same. 4,462,665, Cl. 351-160.00H.
Shaner, Kenneth H.: *See*—
Miettunen, Robert E.; and Shaner, Kenneth H., 4,462,724, Cl. 407-30.000.
Shanton, Kenneth J., to Wiggins Teape Group Limited, The. Record material. 4,462,616, Cl. 346-210.000.
Sharman, Richard A.: *See*—
Powell, Philip G.; and Sharman, Richard A., 4,463,381, Cl. 358-166.000.
Sharp, Joseph F., to Ceiling Dynamics, Inc. Suspended ceiling system. 4,462,198, Cl. 52-667.000.
Sharp Kabushiki Kaisha: *See*—
Nishiura, Yoshikazu; Mineyama, Takitsugu; and Inoue, Kazuo, 4,463,440, Cl. 364-900.000.
Tanabe, Takeshi, 4,463,238, Cl. 219-10.55B.
Shaw, Herbert J.; and Digonnet, Michel J. F., to Leland Stanford Junior University, Board of Trustees of the. Fiber coupler temperature transducer. 4,462,699, Cl. 374-131.000.
Shell Oil Company: *See*—
Johnson, Thomas H., 4,463,207, Cl. 585-462.000.
Matthews, Peter H. D.; and Morecroft, Derek W., 4,462,918, Cl. 252-32.70E.
Rambow, Frederick H. K., 4,463,378, Cl. 358-112.000.
Shepherd, Robin G., to John Wyeth & Brother Limited. Process for making m-hydroxyphenyl substituted compounds. 4,463,177, Cl. 546-221.000.
Sher, Frank T.: *See*—
Balchunis, Robert J.; and Sher, Frank T., 4,463,114, Cl. 524-157.000.

Sherwood Selpac Corp.: *See*—
Trinkwalder, Joseph C., Jr., 4,462,417, Cl. 137-39.000.
Sherwood Systems, Inc.: *See*—
Romberg, Harvey D., 4,462,743, Cl. 414-306.000.
Shibuki, Osamu; Sakagami, Shigeru; and Umesmura, Yoichi, to Toyota Shatai Kabushiki Kaisha. Door operating device for a slide door unit. 4,462,185, Cl. 49-218.000.
Shibuya, Chisei: *See*—
Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, 4,463,179, Cl. 548-255.000.
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Doped photoconductive film comprising selenium and tellurium. 4,463,279, Cl. 313-386.000.
Shigeyama, Yukinori: *See*—
Kameyama, Kazuhide; Kiyofuji, Takahiro; and Shigeyama, Yukinori, 4,462,456, Cl. 164-448.000.
Shiibayashi, Masao: *See*—
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,462,772, Cl. 418-55.000.
Shikakura, Kohichi: *See*—
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Shimano Industrial Company, Limited: *See*—
Shimano, Keizo, 4,462,267, Cl. 74-489.000.
Shimano, Keizo, to Shimano Industrial Company, Limited. Handlebar for a bicycle. 4,462,267, Cl. 74-489.000.
Shimatani, Michiro: *See*—
Kazama, Toyoki; and Shimatani, Michiro, 4,462,862, Cl. 156-643.000.
Shimazaki, Yoshikazu: *See*—
Tokunaga, Yukio; Ikeda, Yasuhisa; Seto, Tadao; and Shimazaki, Yoshikazu, 4,463,034, Cl. 427-256.000.
Shimizu, Keiichi: *See*—
Mochida, Haruo; Shimizu, Keiichi; and Namazue, Hirotoshi, 4,463,349, Cl. 340-825.320.
Shimizu, Masayoshi; Yamagishi, Takashi; and Noguchi, Yukio, to Nippon Sheet Glass Co., Ltd. Converging light transmitting body of high performance and process for production thereof. 4,462,663, Cl. 350-413.000.
Shimizu, Noboru: *See*—
Yamamoto, Hiroshi; Shimizu, Noboru; Suenaga, Masahide; Tsukada, Yukihisa; and Takeura, Tooru, 4,462,881, Cl. 204-192.0EC.
Shimura, Akira; and Takashi, Yokota, to Ricoh Company, Ltd. Skew control apparatus for endless-belt-shaped recording material. 4,462,676, Cl. 355-3.0BE.
Shinada, Yasukavu; and Nerincks, Daniel E., to Toa Nenryo Kogyo Kabushiki Kaisha. Process for improving adhesion of rubbery polymers by reacting with silanes in two stages. 4,463,129, Cl. 525-63.000.
Shinohara, Takashi: *See*—
Nishizawa, Yoshihiko; Takezawa, Taihei; and Shinohara, Takashi, 4,463,024, Cl. 426-533.000.
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Kitajima, Masao; Seshimoto, Osamu; Namiki, Tomizo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Mizobuchi, Yuzo, 4,463,083, Cl. 430-273.000.
Shionogi & Co., Ltd.: *See*—
Ogata, Masaru; Tawara, Katsuya; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Takahashi, Toshio, 4,463,011, Cl. 424-273.00R.
Shiota, Hiroshi: *See*—
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Shipley Company Inc.: *See*—
McClean, June L., 4,462,861, Cl. 156-640.000.
Shipley, Fred J.: *See*—
Pace, Max L.; Shipley, Fred J.; and Webb, Jerald H., 4,462,409, Cl. 128-675.000.
Shirato, Yoshiaki: *See*—
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Shirley, Howard L. Adjustable photographic light stand. 4,463,413, Cl. 362-401.000.
Shirota, Norihisa: *See*—
Hashimoto, Yoshitaka; Yamamoto, Kaichi; and Shirota, Norihisa, 4,463,387, Cl. 358-310.000.
Shkolnik, Nikolay. Walking apparatus. 4,462,476, Cl. 180-8.600.
Shook, Edgar G.: *See*—
Simroth, Donald W.; Critchfield, Frank E.; and Shook, Edgar G., 4,463,107, Cl. 521-137.000.
Shook, Frankie S.: *See*—
Bushaw, Kenneth A.; Branson, William I.; Rehage, Ted A.; and Shook, Frankie S., 4,463,417, Cl. 364-200.000.
Shop-Vac Corporation: *See*—
Berfield, Robert C.; and Fegan, Richard M., 4,462,137, Cl. 15-353.000.
Shopsky, Harvey J.: *See*—
Genbauffe, Francis S.; Erdelsky, Joseph J.; and Shopsky, Harvey J., 4,462,424, Cl. 137-613.000.
Short, Robert D., III; Bennett, Clarence L., Jr.; Barnes, Richard M.; Smith, Robert S.; and Pyle, Harold W., to Sperry Corporation. Apparatus for control of clutter breakthrough in MTI radar. 4,463,356, Cl. 343-7.700.
Showa Aluminum Corporation: *See*—
Uchiyama, Toshimitsu; Isoyama, Eizo; Takenaka, Hiroichi; and Kaji, Masayuki, 4,462,842, Cl. 148-6.15R.
Showa Jakuhin Kako Co., Ltd.: *See*—
Nakao, Shunichi; Yamauchi, Motonori; and Suzuki, Churyo, 4,462,136, Cl. 15-167.00R.
Shukuri, Katsuhiro: *See*—
Tamura, Akihiko; Shukuri, Katsuhiro; Kawamoto, Kiyoaki; and Iwahashi, Haruo, 4,463,284, Cl. 315-158.000.
SI Handling Systems, Inc.: *See*—
Sleep, Craig F.; and Gutekunst, Stanley K., 4,462,313, Cl. 104-50.000.
Sibeud, Jean P.: *See*—
Bonnetain, Yves; and Sibeud, Jean P., 4,463,427, Cl. 364-442.000.
Sidebottom, Donald L., to General Electric Company. Refrigerator door usage monitor and display system. 4,463,348, Cl. 340-585.000.
Siefert, George J.; Kolowski, Michael A.; Lynch, John E.; Ruip, Terrence M.; and Gresens, Henry L., to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,462,447, Cl. 152-353.00C.
Siegel, Clifford M. to United States of America, National Aeronautics and Space Administration. Epitaxial thinning process. 4,462,871, Cl. 204-1.00T.
Siegfried Aktiengesellschaft: *See*—
Marti, Hans-Rudolf; and Gnehm, Rene , 4,463,195, Cl. 568-424.000.
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Beyer, Dieter, 4,462,656, Cl. 339-154.00A.
Haeusele, Hans, 4,463,450, Cl. 365-200.000.
Hassan, Mohamed A., 4,463,404, Cl. 361-128.000.
Landgraf, Hermann; and Hain, Josef, 4,462,803, Cl. 433-88.000.
Munil, Rudolf V., 4,463,295, Cl. 318-436.000.
Schwabe, Ulrich, 4,462,149, Cl. 29-571.000.
Utner, Ferdinand; and Vetter, Harald, 4,463,338, Cl. 338-281.000.
Siemens-Allis, Inc.: *See*—
Kleinecke, John D., 4,463,335, Cl. 337-4.000.
Kleinecke, John D.; Little, Thomas R.; and Farag, Samir F., 4,463,408, Cl. 361-342.000.
Sieracki, Leonard M.: *See*—
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Sieren, Gerald E., to Allis-Chalmers Corp. Front end tractor weight assembly. 4,462,611, Cl. 280-759.000.
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Sierra Monitor Corporation: *See*—
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Fischer, Herbert, 4,462,515, Cl. 198-426.000.
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Silverstein, Fred E.; and Giuliani, David, to Advanced Technology Laboratories, Inc. Ultrasonic endoscope having elongated array mounted in manner allowing it to remain flexible. 4,462,408, Cl. 128-660.000.
Silvey, Fred H.; and Smith, Jeffrey G., to Ironstite Products Co., Inc. Apparatus for forming a groove. 4,462,726, Cl. 408-76.000.
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Brannock, Paul H., 4,462,129, Cl. 5-474.000.
Simon, Michael: *See*—
Laussermair, Friedrich; and Simon, Michael, 4,462,391, Cl. 126-432.000.
Simons, Elliot; and Boulos, Robert. Swimming apparatus. 4,462,400, Cl. 128-207.160.
Simpkins, Gideon M.; and Drummond, William E., to Tracor Xray Inc. Rotatable support for selectively aligning a window with the channel of a probe. 4,463,257, Cl. 250-310.000.
Simroth, Donald W.; Critchfield, Frank E.; and Shook, Edgar G., to Union Carbide Corporation. Polymer/polyol compositions having improved combustion resistance. 4,463,107, Cl. 521-137.000.
Sinclair, Bobby W.: *See*—
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Singer Company, The: *See*—
Larsen, Robert H., 4,462,324, Cl. 112-279.000.
Obermann, George; Kothe, Erich; and Redfield, William H., 4,463,225, Cl. 200-35.00R.
Socha, Robert J., 4,462,323, Cl. 112-239.000.
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Singh, Baldev: *See*—
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Siniscal, Paul D.: *See*—
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Siol, Werner: *See*—
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Sirel, Michel, to Les Cables De Lyon. Apparatus for protecting an electric line against disturbances with very steep wave fronts. 4,463,406, Cl. 361-56.000.
Skoog, Knut A. Piston-cylinder sealing device. 4,462,601, Cl. 277-27.000.
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Erasov, Fedor N.; Levitsky, Viktor K.; and Skripkin, Sergei V., 4,462,773, Cl. 418-61.00B.
Sleep, Craig F.; and Gutekunst, Stanley K., to SI Handling Systems, Inc. Apparatus for shuttling driverless vehicles. 4,462,313, Cl. 104-50.000.
Smeets, Frans H. M., to U.S. Philips Corporation. Electric coil on core with angled end surface. 4,463,334, Cl. 336-192.000.
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Smets, John S., 4,462,746, Cl. 414-330.000.
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Smidt, Gary L.; Amundsen, Louis R.; and Herring, Thomas B., to United States of America, Health and Human Services. Trunk dynamometer. 4,462,252, Cl. 73-379.000.
Smith, Alan L., to Calgon Corporation. Method of controlling Corbicula. 4,462,914, Cl. 210-755.000.
Smith, Carl M., to Allen Industries, Inc. Forming apparatus. 4,462,785, Cl. 425-387.100.
Smith, Charles F.; Parks, George R.; Correa, Gustavo A.; and Holley, Ralph N., to Dow Chemical Company, The. Method and apparatus for setting a cement plug in the wide-mouth shaft of an earth cavern. 4,462,714, Cl. 405-55.000.
Smith, Donald P.: *See*—
Henke, Mitchell C.; Bell, Gordon D.; Smith, Donald P.; and Archer, Virgil L., 4,462,383, Cl. 126-21.00A.
Smith, E. Garland, Jr.: *See*—
Fiorentino, Robert J.; and Smith, E. Garland, Jr., 4,462,234, Cl. 72-41.000.
Smith, Gary W., to General Electric Company. Fixture for electrode wire EDM apparatus. 4,463,241, Cl. 219-69.00W.
Smith, Hoyt L.; and Farrar, D. Frank, Jr., to Cutters Exchange, Inc. Handle control apparatus for cloth spreading machine. 4,462,582, Cl. 270-31.000.
Smith, Hoyt L.; and Farrar, D. Frank, Jr., to Cutters Exchange, Inc. Variable cloth feed speed control for cloth spreading machine. 4,462,583, Cl. 270-31.000.
Smith, Hoyt L.; and Farrar, D. Frank, Jr., to Cutters Exchange, Inc. Clamp device for cloth spreading machine switch actuator. 4,462,584, Cl. 270-31.000.
Smith, James A., to Creative Products Resource, Associates Ltd. Cosmetic applicator useful for skin moisturizing and deodorizing. 4,462,981, Cl. 424-27.000.
Smith, James D.: *See*—
George, James M.; and Smith, James D., 4,462,416, Cl. 134-104.000.
Smith, Jeffrey G.: *See*—
Silvey, Fred H.; and Smith, Jeffrey G., 4,462,726, Cl. 408-76.000.
Smith, Kendall O., to Ens Bio Logicals, Inc. Synergistic anti-herpes compositions. 4,462,986, Cl. 424-85.000.
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Smith, Stanley B., Jr.; and Hieftje, Gary M., to Instrumentation Laboratory Inc. Spectroanalytical system. 4,462,685, Cl. 356-307.000.
Smith, Wallace L.; and Ferman, Randal S., to Borg-Warner Corporation. Centrifugal pump improvement. 4,462,751, Cl. 415-89.000.
Smith, William T.: *See*—
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Snow, Robert A.; and Klein, Gerald W., to Eastman Kodak Company. Polymeric mordants. 4,463,080, Cl. 430-213.000.
Snowdon, Albert C.; Forsell, Kenneth A.; Theisen, Peter J.; Zarling, Emil W.; and Porter, David G., to Eaton Corporation. Compliant electrical connector for flat conductors. 4,462,657, Cl. 339-256.00S.
Snyder, James K.: *See*—
Matteucci, John S.; Snyder, James K.; and Hahn, Robert E., 4,463,047, Cl. 428-216.000.
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S.A. Automobiles Citroen: *See*—
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Societe Anonyme Dite: Carty: *See*—
Ulmer, Georges; and Genin, Bernard C. D., 4,462,615, Cl. 277-235.00B.
Societe Anonyme dite: Etude et Realisation de Chaines Automatiques ERCA: *See*—
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Societe Automobiles Peugeot: *See*—
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Someya, Nobuo. Process for preparing a bacteriological inhibitor for water. 4,463,031, Cl. 427-217.000.
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South Bend Controls, Inc.: *See*—
Everett, William F., 4,463,332, Cl. 335-258.000.
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King, Roderick V., 4,462,235, Cl. 72-103.000.
Specker, Lawrence J.; Jennings, Thomas J.; and Connors, Michael P., to United States of America, Air Force. Simple nonrestrictive arm restraint system. 4,462,563, Cl. 244-122.0AG.
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Speed, Russell H., to Franklin Electric Co., Inc. Water well pump control assembly. 4,462,758, Cl. 417-38.000.
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Short, Robert D., III; Bennett, Clarence L., Jr.; Barnes, Richard M.; Smith, Robert S.; and Pyle, Harold W., 4,463,356, Cl. 343-7.700.
Spinner, Joel B., to UOP Inc. Alkylation process with improved linear alkylbenzene recovery. 4,463,205, Cl. 585-455.000.
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Sprick, Ellis H. Carburetor with rotary mixing valve. 4,462,944, Cl. 261-18.00A.
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Stavitsky, David; and Beres, Ernest A., to RCA Corporation. Injection molding apparatus. 4,462,780, Cl. 425-144.000.
Steel, James, to Ogden Electronics Ltd. Overspeed engine control. 4,462,479, Cl. 180-171.000.
Steele, Scott W., to Owens-Illinois, Inc. Thermoplastic container parison. 4,463,056, Cl. 428-542.800.
Steer, Peter L.; and Edwards, John V., to Kingsdown Medical Consultants Limited. Tap for drainage bag. 4,462,510, Cl. 222-48.000.
Steinberg, Meyer; and Fallon, Peter, to United States of America, Energy. Production of chemical feedstock by the methanolysis of wood. 4,463,210, Cl. 585-469.000.
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Stevens, William E.; Hill, Joel B., Jr.; and Davies, Reg, to Du Pont de Nemours, E. I., and Company. Process for preparing soft TiO_2 agglomerates. 4,462,979, Cl. 423-613.000.
Stieg, Robert W., to Mack Trucks, Inc. Automatic differential control apparatus. 4,462,271, Cl. 74-711.000.
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Stoltman, Donald D.; and Storey, Edwin C., to General Motors Corporation. Pressure transducer. 4,462,259, Cl. 73-749.000.
Stone, Richard L., to Wallace Murray Corporation. Prefabricated double-walled metal chimney. 4,462,618, Cl. 285-47.000.
Storer, James E.; and Waggett, James A., to CSP, Inc. Method of processing an iterative program loop. 4,463,422, Cl. 364-300.000.
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Strickland, Cynthia E., to Otis Engineering Corporation. Controlling injection of fluids into wells. 4,462,465, Cl. 166-117.500.
Stritzke, Detlef, to Deutsche Gesellschaft fur Wiederaufarbeitung. Method and device for the removal of the suction tube of a glass-filled final storage container. 4,462,200, Cl. 53-467.000.
Strobel, Rudolf G. K., to Procter & Gamble Company, The. Process for preparing a citrus fruit juice concentrate. 4,463,025, Cl. 426-599.000.
Strohmeyer, Charles, Jr. Circulating fluidized bed combustion system for a steam generator with provision for staged firing. 4,462,341, Cl. 122-4.00D.
Stuart, John A. Grain moisture meter. 4,462,250, Cl. 73-73.000.
Stuchal, Frank W., to Goodyear Tire & Rubber Company, The. N-(Substituted oxymethyl)melamine derivatives as silica coupling agents. 4,463,125, Cl. 524-566.000.
Sturgis, Frank. Accessory for electric drill. 4,462,728, Cl. 408-241.00R.
Stutts, Kenneth J., to Dow Chemical Company, The. Preparation of nickel-oxide hydroxide electrode. 4,462,875, Cl. 204-56.00R.
Stynes, Peter C., to Phillips Petroleum Company. Fluid distributor means. 4,462,966, Cl. 422-220.000.
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Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Co., Limited. Manual valve for hydraulic control system for automatic transmission. 4,462,280, Cl. 74-868.000.
Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, to Matsushita Electric Industrial Co., Ltd. Electric fan assembly. 4,462,750, Cl. 415-54.000.
Sugimoto, Shigeo; Minowa, Ryohei; and Sakai, Kozi, to Hitachi, Ltd. Dilute solution producing system of absorption refrigerating apparatus. 4,462,222, Cl. 62-476.000.
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Sumitomo Bakelite Company, Limited: *See*—
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Sumiya, Koji, to Aisin Warner Kabushiki Kaisha. 1-2 Shift valve for an automatic transmission. 4,462,279, Cl. 74-868.000.
Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, to Toyo Stauffer Chemical Co., Ltd. Method for homo- or co-polymerization of α-olefin. 4,463,145, Cl. 526-142.000.
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optically active 2,2-dimethylcyclopropane-1-carboxylic acid. 4,463,188, Cl. 562-506.000.

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Koumura, Noboru; Ayata, Naoki; Saito, Seiji; Suzuki, Hidetoshi; and Ozawa, Kunitaka, 4,463,361, Cl. 346-134.000.

Suzuki, Hirosuke. Dielectric waveguide. 4,463,329, Cl. 333-239.000.

Suzuki, Hitoshi; and Kodama, Toshikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Surface acoustic wave device. 4,463,327, Cl. 333-194.000.

Suzuki, Keiichi, to Seiko Instruments & Electronics Ltd. Switching electrode portion of a circuit board for an electronic watch. 4,463,218, Cl. 174-68.500.

Suzuki, Keizo: *See*—
Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; Kanomata, Ichiro; Okudaira, Sadayuki; and Saida, Hiroji, 4,462,863, Cl. 156-643.000.

Suzuki, Kiziro; and Takahashi, Yoshiharu, to Konishiroku Photo Industry Co., Ltd. Camera warning shake system. 4,462,671, Cl. 354-430.000.

Suzuki, Masao: *See*—
Takahashi, Tsunetoshi; Suzuki, Masao; and Okinaka, Tadayuki, 4,462,844, Cl. 148-12.00E.

Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Self-timer device for camera. 4,462,669, Cl. 354-400.000.

Suzuki, Nobuyuki: *See*—
Uchidoi, Masanori; and Suzuki, Nobuyuki, 4,462,673, Cl. 354-458.000.

Suzuki, Ryo, to Hitachi, Ltd. Magnetic bubble generator. 4,463,447, Cl. 365-12.000.

Suzuki, Tatsuo, to Terumo Corporation. Breathing circuit. 4,462,397, Cl. 128-200.140.

Suzuki, Toshihiko; and Matsui, Noboru, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Humidity sensor. 4,462,930, Cl. 252-519.000.

Suzuki, Yasuo: *See*—
Kikuchi, Noribumi; Suzuki, Yasuo; Onishi, Taijiro; and Washizu, Fumio, 4,463,033, Cl. 427-255.300.

Svechinsky, Gregory: *See*—
Raevsky, Vitaly; and Svechinsky, Gregory, 4,462,831, Cl. 106-18.260.

Swanson Systems, Inc.: *See*—
Grafius, Gerald R., 4,462,508, Cl. 221-201.000.

Swartz, Craig, to Motorola, Inc. Temperature compensation circuit for pressure sensor. 4,463,274, Cl. 307-491.000.

Swiss Aluminium Ltd.: *See*—
Bloeck, Siegfried, 4,462,732, Cl. 413-8.000.
Kugler, Tibor, 4,462,886, Cl. 204-284.000.

SWS Silicones Corporation: *See*—
Collins, Wendell; and Brooks, Howard L., 4,463,120, Cl. 524-274.000.

Sycan Advanced Technology Corp.: *See*—
Camilleri, Thomas M., 4,462,578, Cl. 267-9.00C.

Szendroi, Balint: *See*—
Carlsson, Valdemar; and Szendroi, Balint, 4,462,766, Cl. 417-430.000.

Szeto, Whalun: *See*—
Schlienger, Max P.; and Szeto, Whalun, 4,463,242, Cl. 219-69.00V.

Szmanda, Charles R., to AT&T Bell Laboratories. End point detection. 4,462,860, Cl. 156-626.000.

T.I.M.E. Welding Gas Corporation: *See*—
Church, John G., 4,463,243, Cl. 219-74.000.

T & M Rubber, Inc.: *See*—
Koser, Charles W., 4,462,782, Cl. 425-183.000.

T&R Chemicals, Inc.: *See*—
Arias-Alvarez, Jose A., 4,462,988, Cl. 424-162.000.

T. Sendzimir, Inc.: *See*—
Turley, John W.; and Sendzimir, Michael G., 4,462,236, Cl. 72-242.000.

Tachibana, Akihiro: *See*—
Hino, Minoru; Oshima, Takao; and Tachibana, Akihiro, 4,463,134, Cl. 525-109.000.

Tada, Yoshiharu; and Kitano, Yuichi, to Diesel Kiki Kabushiki Kaisha. Vehicle motor driving circuit. 4,463,296, Cl. 318-452.000.

Taff, Douglas C.: *See*—
Holdridge, Robert B.; Taff, Douglas C.; and Yanda, William F., 4,462,390, Cl. 126-430.000.

Taguchi, Masahiro: *See*—
Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, 4,462,379, Cl. 123-569.000.

Tajima, Kunio: *See*—
Fukunaga, Takeshi; and Tajima, Kunio, 4,462,850, Cl. 156-110.100.

Takagi, Tomio, to Sumitomo Heavy Industries, Ltd. Transfer mechanism. 4,462,521, Cl. 198-621.000.

Takahashi, Akira: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,463,394, Cl. 360-96.500.

Takahashi, Masayuki: *See*—
Nakahara, Yutaka; Akutsu, Mitsuo; Haruna, Tohru; and Takahashi, Masayuki, 4,463,113, Cl. 524-117.000.

Takahashi, Toshio: *See*—
Ogata, Masaru; Tawara, Katsuya; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Takahashi, Toshio, 4,463,011, Cl. 424-273.00R.

Takahashi, Tsunetoshi; Suzuki, Masao; and Okinaka, Tadayuki, to Nippon Steel Corporation. Process for manufacturing hot extruded alloy products. 4,462,844, Cl. 148-12.00E.

Takahashi, Yoshiharu: *See*—
Suzuki, Kiziro; and Takahashi, Yoshiharu, 4,462,671, Cl. 354-430.000.

Takahashi, Yoshikazu: *See*—
Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, 4,463,145, Cl. 526-142.000.

Takahashi, Yutaka: *See*—
Sugawara, Norio; Nawa, Motoyuki; and Takahashi, Yutaka, 4,462,750, Cl. 415-54.000.

Takakuwa, Masao, to Tobo- Polymer Kabushiki Kaisha. Membrane switch having spacer posts. 4,463,232, Cl. 200-159.00B.

Takane, Hisao, to Nippon Electric Co., Ltd. Microprogram control system. 4,463,419, Cl. 364-200.000.

Takano, Masayuki; Sakai, Masaaki; and Enoki, Masaharu, to Sony Corporation. Video tape editor. 4,463,391, Cl. 360-14.200.

Takano, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Control system for automatic transmission with overdrive device. 4,462,276, Cl. 74-866.000.

Takasaki, Yukio: *See*—
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.

Takashi, Yokota: *See*—
Shimura, Akira; and Takashi, Yokota, 4,462,676, Cl. 355-3.0BE.

Takashima, Akio: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; Fujimaki, Tatsuo; Yamaguchi, Shinsuke; and Tomita, Seisuke, 4,463,133, Cl. 525-99.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,462,999, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,463,002, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,463,003, Cl. 424-246.000.

Takata, Akihiko; and Hasegawa, Yoshihiko, to Scovill Japan Kabushiki Kaisha. Fastener-attaching apparatus. 4,462,517, Cl. 198-451.000.

Takatori, Yasushi: *See*—
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 4,463,359, Cl. 346-1.100.

Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. 7-Acylamino-3-substituted cephalosporanic acid derivatives and processes for the preparation thereof. 4,462,999, Cl. 424-246.000.

Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. Syn-isomers of 7-substituted-3-cephem-4-carboxylic acid esters. 4,463,002, Cl. 424-246.000.

Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,463,003, Cl. 424-246.000.

Takeda Chemical Industries, Ltd.: *See*—
Horii, Satoshi; Mizokami, Nariakira; and Kuwada, Yutaka, 4,463,172, Cl. 544-027.000.
Noda, Etsunosuke; Matukura, Yoshiharu; and Nagai, Akihiro, 4,462,996, Cl. 424-243.000.

Takegawa, Yujiro, to Tsudakoma Kogyo Kabushiki Kaisha. Weft reservoir for fluid-jet looms. 4,462,434, Cl. 139-452.000.

Takenaka, Hiroichi: *See*—
Uchiyama, Toshimitsu; Isoyama, Eizo; Takenaka, Hiroichi; and Kaji, Masayuki, 4,462,842, Cl. 148-6.15R.

Takeuchi, Kunihiko; and Okuda, Hidefumi, to Nippon Paint Co., Ltd. Metallic coating using two coat one bake method. 4,463,038, Cl. 427-407.100.

Takeuchi, Ryoichi: *See*—
Ito, Kanichi; Hirayama, Yoshio; and Takeuchi, Ryoichi, 4,462,695, Cl. 366-345.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Tatsuta, Kuniaki; Ishikura, Tomoyuki; Okamoto, Rokuro; Yamamoto, Masao; and Kiyoshima, Kohki, 4,463,171, Cl. 536-7.100.

Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; Fujimaki, Tatsuo; Yamaguchi, Shinsuke; and Tomita, Seisuke, to Bridgestone Tire Company Limited; and Japan Synthetic Rubber Co., Ltd. Rubber compositions suitable for use in tire tread. 4,463,133, Cl. 525-99.000.

Takeura, Tooru: *See*—
Yamamoto, Hiroshi; Shimizu, Noboru; Suenaga, Masahide; Tsukada, Yukihisa; and Takeura, Tooru, 4,462,881, Cl. 204-192.0EC.

Takezawa, Taihei: *See*—
Nishizawa, Yoshihiko; Takezawa, Taihei; and Shinohara, Takashi, 4,463,024, Cl. 426-533.000.

Takitani, Masaru: *See*—
Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, 4,463,145, Cl. 526-142.000.

Takuji, Koyanagi; Nobuhiro, Ono; and Hiroyuki, Kitamura, to Ina Seito Co., Ltd. Lightweight and dimensionally accurate resin concrete molded products. 4,463,041, Cl. 428-35.000.

Taller, Robert A.: *See*—
McGary, Charles W., Jr.; Pascarella, Vincent J.; Rhodes, Delmer R.; and Taller, Robert A., 4,463,156, Cl. 528-65.000.

Tama, Tomeaki: *See—*
Yoshii, Takashi; Horii, Yasuyuki; and Tama, Tomeaki, 4,462,273, Cl. 74-745.000.

Tamagni, Albert J.: *See—*
Parkell, Edward; and Tamagni, Albert J., 4,462,519, Cl. 198-490.000.

Tamura, Akihiko; Shukuri, Katsuhiro; Kawamoto, Kiyoaki; and Iwahashi, Haruo, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for controlling luminous intensity of fluorescent lamp of reproducing apparatus. 4,463,284, Cl. 315-158.000.

Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Image forming process and apparatus therefor. 4,463,364, Cl. 346-160.000.

Tanabe, Isao: *See—*
Miyauchi, Tateoki; Mizukoshi, Katsuro; Hongo, Mikio; Mitani, Masao; Okunaka, Masaaki; Kawanabe, Takao; and Tanabe, Isao, 4,463,073, Cl. 430-5.000.

Tanabe, Osamu, to Alps Electric Co., Ltd. Push switch having a drive member formed unitarily with the housing. 4,463,233, Cl. 200-159.00A.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Kisumi, Masahiko; Komatsubara, Saburo; and Murata, Kousaku, 4,463,094, Cl. 435-115.000.
Samejima, Masayoshi; Hirata, Goichi; Koida, Yoshiyuki; Kobayashi, Yoshinori; and Kida, Akira, 4,462,982, Cl. 424-35.000.

Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Combined microwave and electric heating oven selectively controlled by gas sensor output and thermistor output. 4,463,238, Cl. 219-10.55B.

Tanabe, Yoshiyuki; Kashiwaya, Mineo; Hikichi, Akira; and Aochi, Yoshikazu, to Hitachi, Ltd. Fuel controller for internal combustion engine. 4,462,367, Cl. 123-442.000.

Tanaka, Hideki: *See—*
Nishimura, Yuji; and Tanaka, Hideki, 4,462,613, Cl. 280-804.000.

Tanaka, Kazuaki: *See—*
Ichikawa, Masaru; Shikakura, Kohichi; Sekizawa, Kazuhiko; and Tanaka, Kazuaki, 4,463,105, Cl. 518-716.000.

Tanaka, Minoru: *See—*
Todori, Seijiro; and Tanaka, Minoru, 4,462,629, Cl. 296-30.000.

Tanaka, Takeshi; Kawai, Hisasi; Igashira, Toshihiko; Sekiguchi, Kiyonori; and Idogaki, Takaharu, to Nippon Soken, Inc. Exhaust gas recirculation device. 4,462,377, Cl. 123-571.000.

Tang, Peter: *See—*
Diedrichsen, Allan; Johannessen, Marie; and Tang, Peter, 4,462,980, Cl. 424-1.100.

Taniguchi, Hideo: *See—*
Tatsumi, Yutaka; and Taniguchi, Hideo, 4,463,246, Cl. 219-216.000.

Tanikawa, Isao: *See—*
Koyama, Masayasu; Yazaki, Takashi; and Tanikawa, Isao, 4,463,116, Cl. 524-232.000.

Tanioka, Kenkichi: *See—*
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.

Tarjan, Peter P.: *See—*
Herscovici, Hari; and Tarjan, Peter P., 4,462,407, Cl. 128-419.0PG.

Tate, Kazuhito: *See—*
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,893, Cl. 208-40.000.
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,894, Cl. 208-40.000.

Tatsumi, Yutaka; and Taniguchi, Hideo, to Rohm Company Limited. Thermal printing head. 4,463,246, Cl. 219-216.000.

Tatsuta, Kuniaki: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Tatsuta, Kuniaki; Ishikura, Tomoyuki; Okamoto, Rokuro; Yamamoto, Masao; and Kiyoshima, Kohki, 4,463,171, Cl. 536-7.100.

Tawara, Katsuya: *See—*
Ogata, Masaru; Tawara, Katsuya; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Takahashi, Toshio, 4,463,011, Cl. 424-273.00R.

Taylor, Charles W.; and DeJager, Everett J., to Xomox Corporation. Valve construction and method of making the same. 4,462,568, Cl. 251-335.00A.

Taylor, Thomas N.; and Wenthe, Stephen J., Jr., to Xerox Corporation. Device for lateral registration of computer form documents for copying. 4,462,527, Cl. 226-15.000.

Tazuma, James J.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Finishing process for the removal of sulfur compounds from a gas stream. 4,462,968, Cl. 423-224.000.

Tazuma, James J., to Goodyear Tire & Rubber Company, The. Method of preparing dibenzothiazolyl disulfides. 4,463,178, Cl. 548-158.000.

Tazuma, James J.: *See—*
Gloth, Richard E.; Tazuma, James J.; and Smith, Robert A., 4,463,170, Cl. 528-422.000.

TBA Industrial Products Limited: *See—*
Green, David; Stancliffe, Alan D.; Ramsbottom, Lawrence W.; and Thomas, David A., 4,463,109, Cl. 523-333.000.

Technicare Corporation: *See—*
Guess, Joe F.; and Kruer, Thomas R., 4,462,255, Cl. 73-633.000.

Technicon Instruments Corporation: *See—*
Malin, Michael J., 4,463,117, Cl. 524-260.000.

Teegarden, Arlo F., to Trane Company, The. Wrap element and tip seal for use in fluid apparatus of the scroll type and method for making same. 4,462,771, Cl. 418-55.000.

Teledyne Farris Engineering: *See—*
Cullie, Eugene C., 4,462,420, Cl. 137-488.000.

Teno, Richard L.: *See—*
Hicks, Robert H.; Senko, Steve M.; Budenaers, Roland J.; and Teno, Richard L., 4,462,208, Cl. 60-286.000.

Tentler, Lynn A.; and Peck, Paul L., to Total Shooting Systems, Inc. Bow sight. 4,462,163, Cl. 33-265.000.

Teraji, Tsutomu; Sakane, Kazuo; and Goto, Jiro, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,463,000, Cl. 424-246.000.

ter Horst, Gerhardus E. R.: *See—*
Aerts, Wilhelmus J.; ter Horst, Gerhardus E. R.; and Linssen, Johannus L. J. M., 4,462,681, Cl. 355-14.0SH.

Terra Tek, Inc.: *See—*
Green, Sidney J., 4,462,617, Cl. 285-14.000.

Terry, John L.; and Ritten, Robert G., to Step-On Inc. Ladders for transoms of boats. 4,462,485, Cl. 182-84.000.

Terumo Corporation: *See—*
Hirano, Toshinori; and Murase, Masakazu, 4,463,425, Cl. 364-417.000.
Suzuki, Tatsuo, 4,462,397, Cl. 128-200.140.

Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,463,014, Cl. 424-275.000.

Tetra Pak Development, S.A.: *See—*
Reil, Wilhelm, 4,462,202, Cl. 53-526.000.

Texaco Development Corporation: *See—*
Jahnke, Frederick C.; and Muenger, James R., 4,462,339, Cl. 122-7.00R.

Texaco Inc.: *See—*
Dille, Roger M.; Rhodes, Harold A.; and Wallon, Susan B., 4,462,928, Cl. 252-373.000.
Duranleau, Roger G.; and McDaniel, Kenneth G., 4,463,192, Cl. 564-467.000.
Peterson, Edward S.; and Darden, Jerome W., 4,462,921, Cl. 252-78.300.
Zimmerman, Robert L., 4,463,050, Cl. 428-318.800.

Texas Instruments: *See—*
Tregilgas, John H., 4,462,959, Cl. 420-525.000.

Texas Instruments Incorporated: *See—*
Grenier, Aime J.; and Bowen, Robert J., 4,463,401, Cl. 361-72.000.
Laws, Gerald E., 4,463,421, Cl. 364-200.000.
Orcutt, John W., 4,463,217, Cl. 174-52.0FP.
Scott, Bentley N.; and Brehm, Gailon E., 4,463,322, Cl. 331-117.00D.
Thompson, Stephen W.; and Keen, Ralph, 4,462,847, Cl. 148-174.000.

Theilmann, Manfred: *See—*
Schwarz, Theodor; Freyer, Karl; and Theilmann, Manfred, 4,462,404, Cl. 128-321.000.

Theisen, Peter J.: *See—*
Saowdon, Albert C.; Forsell, Kenneth A.; Theisen, Peter J.; Zarling, Emil W.; and Porter, David G., 4,462,657, Cl. 339-256.00S.

Thenner, Johann: *See—*
Ruhl, Erich; and Thenner, Johann, 4,463,106, Cl. 521-103.000.

Thetford Corporation: *See—*
Antos, John M.; Lapham, Richard G.; Sargent, Charles L.; and Sargent, Frank T., 4,462,124, Cl. 4-346.000.

Thibault, Ronald M., to Osborne Industries, Inc. Rotary livestock feeder. 4,462,338, Cl. 119-53.500.

Thomas, David A.: *See—*
Green, David; Stancliffe, Alan D.; Ramsbottom, Lawrence W.; and Thomas, David A., 4,463,109, Cl. 523-333.000.

Thomas, Jacob E., to NCR Corporation. Ink control baffle plates for ink jet printer. 4,463,362, Cl. 346-140.00R.

Thompson, Harwell B., to Timex Corporation. Integral plastic strap and bezel for a wristwatch. 4,462,697, Cl. 368-282.000.

Thompson, Lawrence C.: *See—*
Bogardus, Carl R., Jr.; and Thompson, Lawrence C., 4,462,787, Cl. 425-402.000.

Thompson, Leroy, to Trilog, Inc. Color plotter interface and control circuit. 4,463,374, Cl. 358-78.000.

Thompson, Stephen W.; and Keen, Ralph, to Texas Instruments Incorporated. Fabrication of dielectrically isolated microelectronic semiconductor circuits utilizing selective growth by low pressure vapor deposition. 4,462,847, Cl. 148-174.000.

Thompson, William L.: *See—*
Keyes, Marion A.; and Thompson, William L., 4,462,261, Cl. 73-861.020.

Thomsen, Svend E.; and Kyster, Erik, to Danfoss A/S. Hydraulic control means, particularly steering means. 4,462,209, Cl. 60-384.000.

Thorn, Lawrence B.: *See—*
Betts, Robert E.; and Thorn, Lawrence B., 4,462,483, Cl. 181-142.000.

Tilbrook, Roger W.: *See—*
Lacko, Robert E.; and Tilbrook, Roger W., 4,462,958, Cl. 376-420.000.

Tillmann, Heinz-Gunther: *See—*
Ruch, Jean; Katryniok, Detlef; Pack, Hugo; and Tillmann, Heinz-Gunther, 4,463,064, Cl. 429-27.000.

Timex Corporation: *See—*
Thompson, Harwell B., 4,462,697, Cl. 368-282.000.

Timken Company, The: *See—*
Gilbert, George G.; and Dimit, Richard O., 4,462,643, Cl. 308-202.000.

Tipton, Harry R. Fixed solar collection system. 4,462,392, Cl. 126-439.000.

Titmus Eurocon Kontaktlinsen GmbH KG & Co.: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 4,463,148, Cl. 526-264.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Shinada, Yasukavu; and Nerinckx, Daniel E., 4,463,129, Cl. 525-63.000.

Tobita, Yoshimitsu: *See*—
Fukui, Yutaka; Tobita, Yoshimitsu; Hataya, Fumio; Watanabe, Mitsuhiro; and Mase, Noriaki, 4,462,957, Cl. 376-327.000.

Todori, Seijiro; and Tanaka, Minoru, to Hitachi, Ltd. Construction of car structure. 4,462,629, Cl. 296-30.000.

Toho- Polymer Kabushiki Kaisha: *See*—
Takakuwa, Masao, 4,463,232, Cl. 200-159.00B.

Tohto Kasei Co., Ltd.: *See*—
Hino, Minoru; Oshima, Takao; and Tachibana, Akihiro, 4,463,134, Cl. 525-109.000.

Tojo, Kenji: *See*—
Hazaki, Eiichi; Imai, Masaya; Tojo, Kenji; and Shiibayashi, Masao, 4,462,772, Cl. 418-55.000.

Tokico Ltd.: *See*—
Saito, Tetsuo; and Ema, Sumio, 4,462,610, Cl. 280-707.000.

Tokunaga, Yukio; Ikeda, Yasuhisa; Seto, Tadao; and Shimazaki, Yoshikazu, to Nippon Telegraph & Telephone Public Corp.; and Fuji Kagakushi Kogyo Co., Ltd. Heat-sensitive magnetic transfer element. 4,463,034, Cl. 427-256.000.

Tokyo Boshi Kabushiki Kaisha: *See*—
Nakao, Shunichi; Yamauchi, Motonori; and Suzuki, Churyo, 4,462,136, Cl. 15-167.00R.

Tokyo Juki Industrial Co., Ltd.: *See*—
Horeschi, Giancarlo; and Barozzi, Gian P., 4,462,709, Cl. 400-314.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Abe, Masahiro; Yonezawa, Toshio; Aoyama, Masaharu; and Ajima, Takashi, 4,462,856, Cl. 156-345.000.
Inomata, Koichiro; Hasegawa, Michio; and Kobayashi, Tadahiko, 4,462,826, Cl. 75-123.00B.
Itaya, Keiji, 4,462,679, Cl. 355-14.0CH.
Ito, Daisuke, 4,462,214, Cl. 62-45.000.
Iwata, Takayuki, 4,462,219, Cl. 62-196.100.
Kobayashi, Shunichi, 4,463,311, Cl. 324-142.000.
Kusakabe, Hiromi, 4,463,317, Cl. 329-103.000.
Nakano, Hirotaka; Morita, Hiroshi; and Kato, Taketoshi, 4,463,216, Cl. 136-256.000.
Narita, Ryuho; and Aoshima, Terutaka, 4,463,249, Cl. 219-441.000.
Nishimura, Hidetaro; and Nozawa, Hiroshi, 4,462,150, Cl. 29-576.00B.
Ohba, Hiroshi, 4,462,506, Cl. 221-13.000.
Suzuki, Hitoshi; and Kodama, Toshikazu, 4,463,327, Cl. 333-194.000.

Tomaszewski, Lillie C.; and Tremmel, Robert A., to OMI International Corporation. Cyanide-free copper plating process. 4,462,874, Cl. 204-52.00R.

Tominari, Noboru: *See*—
Ishida, Takashi; and Tominari, Noboru, 4,462,358, Cl. 123-337.000.

Tomita, Seisuke: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; Fujimaki, Tatsuo; Yamaguchi, Shinsuke; and Tomita, Seisuke, 4,463,133, Cl. 525-99.000.

Tomlinson, Dennis E.: *See*—
DeVale, Donald P.; Wilbrandt, Howard B.; Tomlinson, Dennis E.; and Shah, Ashish, 4,463,429, Cl. 364-466.000.

Tooth, Alan J.; and Paak, Neil, to Portals Limited. Sheet materials. 4,462,866, Cl. 162-103.000.

Toppan Printing Co., Ltd.: *See*—
Mikami, Atsutoshi, 4,463,373, Cl. 358-76.000.

Toray Industries, Inc.: *See*—
Matsuura, Kazuo; and Ohshima, Keisuke, 4,463,077, Cl. 430-56.000.

Torkelson, Herman: *See*—
Campbell, Leslie T.; Gordon, Frank E.; and Torkelson, Herman, 4,462,330, Cl. 114-244.000.

Toshiba Heating Appliances Co., Ltd.: *See*—
Sato, Isao; and Nakajima, Kosaku, 4,462,173, Cl. 38-93.000.

Total Shooting Systems, Inc.: *See*—
Tentler, Lynn A.; and Peck, Paul L., 4,462,163, Cl. 33-265.000.

Toth, James E.: *See*—
Gifford, Paul R.; Shacklette, Lawrence W.; Toth, James E.; and Wolf, James F., 4,463,071, Cl. 429-194.000.
Gifford, Paul R.; Palmisano, James B.; Shacklette, Lawrence W.; Chance, Ronald R.; and Toth, James E., 4,463,072, Cl. 429-194.000.

Totten, George E.; and Sabia, Angelo J., to Union Carbide Corporation. Process for imparting hydrophilicity to fabric. 4,463,036, Cl. 427-389.900.

Touda, Masayuki; Akimune, Yoshio; and Matoba, Kazuo, to Nissan Motor Company, Limited. Oxygen sensing element having barrier layer between ceramic substrate and solid electrolyte layer. 4,462,890, Cl. 204-425.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Emi, Shigenori; Kojima, Yoshio; and Ando, Makoto, 4,463,095, Cl. 435-190.000.
Hotani, Mitsuhiro, 4,462,131, Cl. 8-151.200.

Toyo CCI Kabushiki Kaisha: *See*—
Kitagawa, Hiroshi; Onodera, Teruyuki; Fukushima, Toshiyuki; and Hayashi, Yoriyuki, 4,462,896, Cl. 208-253.000.

Toyo Seikan Kaisha, Ltd.: *See*—
Koyama, Masayasu; Yazaki, Takashi; and Tanikawa, Isao, 4,463,116, Cl. 524-232.000.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Baba, Nobuyuki; and Housako, Keiichi, 4,462,962, Cl. 422-58.000.

Toyo Stauffer Chemical Co., Ltd.: *See*—
Sunada, Yoichi; Takahashi, Yoshikazu; and Takitani, Masaru, 4,463,145, Cl. 526-142.000.

Toyoda, Kazuhiro: *See*—
Sugo, Yasuhisa; Toyoda, Kazuhiro; and Yamada, Katuyuki, 4,463,448, Cl. 365-190.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Isobe, Toshiaki; and Ohkawa, Nobuhisa, 4,462,375, Cl. 123-491.000.
Kobayashi, Nobuyuki; Ito, Hiroshi; and Kuma, Takahide, 4,462,360, Cl. 123-339.000.
Kobayashi, Nobuyuki; and Itoh, Hiroshi, 4,462,374, Cl. 123-489.000.
Kono, Hiroya; Hasegawa, Jun; Inagaki, Mitsukane; and Kobayashi, Hisao, 4,462,491, Cl. 192-84.00R.
Motosugi, Katsuhiko; and Koga, Ituo, 4,462,349, Cl. 123-188.00M.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Hattori, Tadashi; Hanaoka, Masanori; Hashiguchi, Yukihide; Ootsuka, Yoshinori; and Yamaguchi, Hiroaki, 4,462,247, Cl. 73-35.000.
Nishimura, Yuji; and Tanaka, Hideki, 4,462,613, Cl. 280-804.000.

Toyota Shatai Kabushiki Kaisha: *See*—
Shibuki, Osamu; Sakagami, Shigeru; and Umemura, Yoichi, 4,462,185, Cl. 49-218.000.

Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu, 4,462,789, Cl. 431-126.000.

Tracor Xray Inc.: *See*—
Simpkins, Gideon M.; and Drummond, William E., 4,463,257, Cl. 250-310.000.

Trane Company, The: *See*—
Teegarden, Arlo F., 4,462,771, Cl. 418-55.000.

Tregilgas, John H., to Texas Instruments. HgCdTe Bulk doping technique. 4,462,959, Cl. 420-525.000.

Tremblay, Richard P.: *See*—
Owoc, James R.; and Tremblay, Richard P., 4,462,422, Cl. 137-557.000.

Tremmel, Robert A.: *See*—
Tomaszewski, Lillie C.; and Tremmel, Robert A., 4,462,874, Cl. 204-52.00R.

Trenkle, Robert W.: *See*—
Hill, Ira D.; Trenkle, Robert W.; Mookherjee, Braja D.; and Wolff, Robin K., 4,462,880, Cl. 204-161.000.

Triebel, Walter; and Bunke, Heinz, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH. High-pressure electric discharge lamp with electrode support. 4,463,281, Cl. 313-623.000.

Trilog, Inc.: *See*—
Fritz, William O.; Chamberlain, John C.; and Chandler, Gary C., 4,462,702, Cl. 400-58.000.
Thompson, Leroy, 4,463,374, Cl. 358-78.000.

Trinkwalder, Joseph C., Jr., to Sherwood Selpac Corp. Valve assembly. 4,462,417, Cl. 137-39.000.

Trinol Chemical Corporation: *See*—
George, James M.; and Smith, James D., 4,462,416, Cl. 134-104.000.

Triplett, James T.: *See*—
Campbell, Bruce D.; and Triplett, James T., 4,462,655, Cl. 339-98.000.

Troutman, Ronald R.: *See*—
Geipel, Henry J., Jr.; Troutman, Ronald R.; and Wursthorn, John M., 4,462,151, Cl. 29-576.00B.

TRP Energy Sensors, Inc.: *See*—
Berndt, Dieter R., 4,463,051, Cl. 428-323.000.

Trumbauer, David V., to Deere & Company. Casting methods with composite molded core assembly. 4,462,453, Cl. 164-32.000.

Trumpf America, Inc.: *See*—
Herb, Eugen; and Leibinger, Berthold, 4,462,147, Cl. 29-423.000.

TRW Inc.: *See*—
Asawa, Charles K.; Barnoski, Michael K.; and Yao, Shi-Kay, 4,463,254, Cl. 250-231.00R.

Tseng, Shin-Shyong: *See*—
Cohen, Martin L.; Arthen, Frank J., Jr.; and Tseng, Shin-Shyong, 4,462,931, Cl. 252-700.000.

Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Motorized two-wheeled vehicle. 4,462,482, Cl. 180-230.000.

Tsuda, Yasuo: *See*—
Sasaki, Takashi; Kaneko, Yutaka; Ishii, Fumio; Tsuda, Yasuo; Kimura, Kazuhiko; and Kato, Katsunori, 4,463,086, Cl. 430-553.000.

Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Satake, Eishin, 4,462,579, Cl. 269-61.000.
Takegawa, Yujiro, 4,462,434, Cl. 139-452.000.

Tsuge, Noboru; Taguchi, Masahiro; Kato, Masanori; and Kuwakado, Satosi, to Nippon Soken, Inc. Exhaust gas recirculating apparatus of a diesel engine. 4,462,379, Cl. 123-569.000.

Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,463,002, Cl. 424-246.000.

Tsukada, Yukihisa: *See*—
Yamamoto, Hiroshi; Shimizu, Noboru; Suenaga, Masahide; Tsukada, Yukihisa; and Takeura, Tooru, 4,462,881, Cl. 204-192.0EC.

Tsunoi, Makoto: *See*—
Watanabe, Teishiro; Tsunoi, Makoto; Kai, Toshio; Shiota, Hiroshi; Nakabayashi, Hiroshi; Tsutsumi, Tadayoshi; and Sakai, Ryuichi, 4,462,777, Cl. 425-87.000.
Tsutsumi, Fumio: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tsutsumi, Fumio; Takashima, Akio; Fujimaki, Tatsuo; Yamaguchi, Shinsuke; and Tomita, Seisuke, 4,463,133, Cl. 525-99.000.
Tsutsumi, Tadayoshi: *See*—
Watanabe, Teishiro; Tsunoi, Makoto; Kai, Toshio; Shiota, Hiroshi; Nakabayashi, Hiroshi; Tsutsumi, Tadayoshi; and Sakai, Ryuichi, 4,462,777, Cl. 425-87.000.
Tuason, Domingo C., Jr.: *See*—
McGinley, Emanuel J.; and Tuason, Domingo C., Jr., 4,462,839, Cl. 106-198.000.
Tucker, Brian D., to Gould Advance Limited. Automatic drift correction. 4,463,272, Cl. 307-358.000.
Tultz, Joseph P.: *See*—
Wagner, Melvin P.; Tultz, Joseph P.; and Krivak, Thomas G., 4,463,108, Cl. 523-216.000.
Tumber, Brian W., to Lucas Industries Limited. Fuel pumping apparatus. 4,462,371, Cl. 123-450.000.
Tupper, Alan W. Load transfer or traversing device. 4,462,316, Cl. 105-151.000.
Turley, John W.; and Sendzimir, Michael G., to T. Sendzimir, Inc. Fourteen-high rolling mill. 4,462,236, Cl. 72-242.000.
Turner, Norman L.: *See*—
Robertson, David A.; and Turner, Norman L., 4,463,255, Cl. 250-251.000.
Turner, Paul F., to BSD Medical Corporation. Annular electromagnetic radiation applicator for biological tissue, and method. 4,462,412, Cl. 128-804.000.
Tyler, Derek E.: *See*—
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,462,457, Cl. 164-503.000.
Tyler, Loren E., to Lor-Al Corporation. Apparatus for distributing a substance. 4,462,550, Cl. 239-655.000.
Tyrell, John A.; Liu, Ping Y.; and Freimiller, Gary L., to General Electric Company. Composition comprising a polyolefin and a block copolymer of a dihydric phenol monomer, a carbonate precursor and a polyphenylene oxide resin. 4,463,132, Cl. 525-92.000.
Tzikas, Athanassios, to Ciba-Geigy Corporation. Process for producing dibenzanthrone containing vat dyes. 4,463,174, Cl. 544-131.000.
U.M.C. Industries, Inc.: *See*—
Shah, Hasmukh R.; and Gupta, Ashok K., 4,463,446, Cl. 364-900.000.
Uchida, Teruo: *See*—
Shidara, Keiichi; Tanioka, Kenkichi; Uchida, Teruo; Kusano, Chushirou; Takasaki, Yukio; Nonaka, Yasuhiko; and Inoue, Eisuke, 4,463,279, Cl. 313-386.000.
Uchidoi, Masanori; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Shutter time control circuit. 4,462,673, Cl. 354-458.000.
Uchiyama, Toshimitsu; Isoyama, Eizo; Takenaka, Hiroichi; and Kaji, Masayuki, to Showa Aluminum Corporation. Surface treatment process for imparting hydrophilic properties to aluminum articles. 4,462,842, Cl. 148-6.15R.
Uclaf, Roussel: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,463,014, Cl. 424-275.000.
Ude, Werner: *See*—
Besecke, Siegmund; Schroeder, Guenter; Ude, Werner; and Wunderlich, Winfried, 4,463,159, Cl. 528-167.000.
Ueki, Yoshiharu; and Sakaguchi, Shouzaburou, to Pioneer Electronic Corporation. Repeat playback device for tape recorder. 4,463,393, Cl. 360-74.100.
Uemura, Masakazu, to Nissan Motor Company, Limited. Fan blade structure. 4,462,757, Cl. 416-244.00R.
Uhland, Francis L., Jr.: *See*—
Schlotterbeck, Stephen C.; Uhland, Francis L., Jr.; Campbell, Willis R.; and Freimuth, John H., 4,462,203, Cl. 56-341.000.
Uhlig, Raimer; and Lang, Gusztav, to Hilti Aktiengesellschaft. Expansion dowel for a structural component having a hollow space. 4,462,729, Cl. 411-15.000.
Ujimoto, Yasuhiko: *See*—
Kato, Shozo; and Ujimoto, Yasuhiko, 4,462,885, Cl. 204-243.00M.
Ulmer, Georges; and Genin, Bernard C. D., to Societe Anonyme Dite: Curty. Cylinder head gasket. 4,462,615, Cl. 277-235.00B.
UMC Industries, Inc.: *See*—
Schuller, James T., 4,462,512, Cl. 194-1.00N.
Umemoto, Junko: *See*—
Harada, Takahiro; Miyagawa, Eiji; Umemoto, Junko; Yoshida, Tsutomu; and Hamakado, Toshinari, 4,463,091, Cl. 435-68.000.
Umemura, Yoichi: *See*—
Shibuki, Osamu; Sakagami, Shigeru; and Umemura, Yoichi, 4,462,185, Cl. 49-218.000.
Umezawa, Hamao; Takeuchi, Tomio; Tatsuta, Kuniaki; Ishikura, Tomoyuki; Okamoto, Rokuro; Yamamoto, Masao; and Kiyoshima, Kohki, to Sanraku-Ocean Co., Ltd. Derivatives of macrolide antibiotics. 4,463,171, Cl. 536-7.100.
Underhill, Michael J., to U.S. Philips Corporation. R.F. Impedance determination. 4,463,308, Cl. 324-57.00R.
Ungarean, Gary L.: *See*—
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,462,457, Cl. 164-503.000.
Union Carbide Corporation: *See*—
Affeldt, Richard B., 4,463,070, Cl. 429-194.000.
Greene, George H., 4,463,035, Cl. 427-389.900.
Hunt, David A., 4,463,184, Cl. 549-470.000.
Simroth, Donald W.; Critchfield, Frank E.; and Shook, Edgar G., 4,463,107, Cl. 521-137.000.
Totten, George E.; and Sabia, Angelo J., 4,463,036, Cl. 427-389.900.
Uniroyal, Inc.: *See*—
Bogulawski, Jan J., 4,462,691, Cl. 366-80.000.
Hunter, Byron A., 4,462,927, Cl. 252-350.000.
United Agencies Limited: *See*—
Yung, Tak-Yim; and Citrin, David, 4,462,696, Cl. 368-84.000.
United States Banknote Corporation: *See*—
Colgate, Gilbert, Jr., 4,462,851, Cl. 156-212.000.
United States Gypsum Company: *See*—
O'Connell, Daniel D.; and Broz, Thomas A., 4,463,039, Cl. 427-421.000.
United States of America
Air Force: *See*—
Contreras, Ben, 4,463,262, Cl. 250-349.000.
Earl, T. Desmond, 4,462,560, Cl. 244-63.000.
Erhard, Herman H., 4,462,286, Cl. 82-1.400.
Frankel, David G.; and Barrett, Michael J., 4,463,443, Cl. 364-900.000.
Schack, Carl J.; Wilson, William W.; and Christe, Karl O., 4,462,975, Cl. 423-473.000.
Schultz, Edwin R., 4,462,562, Cl. 244-122.00A.
Specker, Lawrence J.; Jennings, Thomas J.; and Connors, Michael P., 4,462,563, Cl. 244-122.0AG.
Veneklase, Brian J., 4,463,436, Cl. 364-557.000.
Army: *See*—
Betts, Robert E.; and Thorn, Lawrence B., 4,462,483, Cl. 181-142.000.
Boyce, Gary L., 4,462,288, Cl. 83-128.000.
Gerhart, Grant R.; and Rose, Douglas N., 4,462,257, Cl. 73-644.000.
Energy: *See*—
Lacko, Robert E.; and Tilbrook, Roger W., 4,462,958, Cl. 376-420.000.
Steinberg, Meyer; and Fallon, Peter, 4,463,210, Cl. 585-469.000.
Health and Human Services: *See*—
Smidt, Gary L.; Amundsen, Louis R.; and Herring, Thomas B., 4,462,252, Cl. 73-379.000.
National Aeronautics and Space Administration: *See*—
MacDoran, Peter F., 4,463,357, Cl. 343-460.000.
Siegel, Clifford M., 4,462,871, Cl. 204-1.00T.
Navy: *See*—
Campbell, Leslie T.; Gordon, Frank E.; and Torkelson, Herman, 4,462,330, Cl. 114-244.000.
Chase, Jay V., Jr., 4,463,452, Cl. 367-134.000.
Gilliam, Raymond J., 4,463,428, Cl. 364-463.000.
McCrory, William M., 4,462,331, Cl. 114-345.000.
Moffett, Mark B., 4,462,256, Cl. 73-642.000.
Ogle, Peter C.; and Hibyan, Edward S., 4,462,755, Cl. 416-132.00R.
Phillips, Raymond J., 4,463,358, Cl. 343-709.000.
Rein, Charles R., 4,462,265, Cl. 73-863.330.
Young, Charles A.; Geelhood, Bruce D.; and Silva, Dennis M., 4,463,264, Cl. 250-390.000.
U.S. Philips Corporation: *See*—
Bouwknegt, Jan, 4,462,737, Cl. 414-118.000.
Collet, Marnix G., 4,463,367, Cl. 357-24.000.
Grenier, Didier J. R., 4,463,370, Cl. 357-50.000.
Horne, David R., 4,463,258, Cl. 250-334.000.
Meyer-Ebrecht, Dietrich; and Christiansen, Jens H., 4,463,377, Cl. 358-133.000.
Smeets, Frans H. M., 4,463,334, Cl. 336-192.000.
Underhill, Michael J., 4,463,308, Cl. 324-57.00R.
United States Steel Corporation: *See*—
Keenan, William M.; McGarry, Sheldon; and Bassett, James G., Jr., 4,462,574, Cl. 266-45.000.
Messina, Charles J., 4,462,825, Cl. 75-60.000.
United Technologies Corporation: *See*—
Agrawal, Giridhari L., 4,462,700, Cl. 384-105.000.
Black, James F.; Grudkowski, Thomas W.; and DeMaria, Anthony J., 4,463,336, Cl. 338-4.000.
Harner, Kermit I.; Patrick, John P.; and Vosseller, Kenneth F., 4,462,753, Cl. 416-48.000.
University of California, The Regents of the: *See*—
Hull, Maury L.; and Davis, Rory R., 4,463,433, Cl. 364-506.000.
Lee, Nancy M.; Loh, Horace H.; and Chang, Jaw-Kang, 4,462,941, Cl. 260-112.50R.
University of Florida: *See*—
Carr, William E. S., 4,463,018, Cl. 426-1.000.
University of Illinois Foundation: *See*—
Cummins, Joseph M., Jr., 4,462,985, Cl. 424-85.000.
University of Melbourne, The: *See*—
Rickards, Field W., 4,462,411, Cl. 128-746.000.
University of South Carolina: *See*—
Doty, F. David, 4,463,328, Cl. 333-222.000.
Uno, Teruo: *See*—
Baba, Yoshio; and Uno, Teruo, 4,462,843, Cl. 148-11.50A.
UOP Inc.: *See*—
Antos, George J.; and Chao, Tai-Hsiang, 4,463,104, Cl. 502-213.000.
Imai, Tamotsu, 4,463,212, Cl. 585-530.000.
Spinner, Joel B., 4,463,205, Cl. 585-455.000.

Uozumi, Junzo, to Aisan Kogyo Kabushiki Kaisha. Apparatus for supplying fuel to an internal combustion engine. 4,462,365, Cl. 123-438.000.
Updegraff, Stephen W., to Du Pont de Nemours, E. I., and Company. Solderable palladium-nickel coatings and method of making said coatings. 4,463,060, Cl. 428-669.000.
Upjohn Company, The: *See*—
Collins, Robert J.; Kaplan, Lester J.; Ludens, James H.; and Von Voigtlander, Philip F., 4,463,013, Cl. 424-274.000.
Gammill, Ronald B., 4,463,185, Cl. 549-471.000.
Ura, Syouzabu, to Nissan Motor Company, Limited. Intake and exhaust manifold arrangement of internal combustion engine. 4,462,344, Cl. 123-52.00M.
Usher, Peter P.; and Gavaletz, Eugene J., to Metex Corporation. Knitted wire mesh exhaust coupling seal with refractory metallic oxide impregnant. 4,462,603, Cl. 277-230.000.
USM Corporation: *See*—
Flanders, James R., 4,462,132, Cl. 12-85.000.
Usry, Joe D., to Andale Company. Automatic control system and valve actuator. 4,463,291, Cl. 318-254.000.
Usui, Akaru: *See*—
Azuma, Kenkoku; Kajita, Isao; and Usui, Akaru, 4,462,965, Cl. 422-186.080.
UTI Corporation: *See*—
Goodfellow, Glenn B., 4,462,238, Cl. 72-358.000.
Utner, Ferdinand; and Vetter, Harald, to Siemens Aktiengesellschaft. Electrical network and method for producing the same. 4,463,338, Cl. 338-281.000.
V M E I "Lenin": *See*—
Kassabov, Nikola K.; and Dakovski, Lyudmil G., 4,463,441, Cl. 364-900.000.
Valchev, Alexander Y.: *See*—
Savov, Peter H.; Bakalov, Nikolay G.; Valchev, Alexander Y.; Drakaliiski, Boris Y.; Peev, Vassil G.; Bagarov, Stefan T.; Krestenyakov, Yordan I.; Milenkov, Rusi T.; Stoilov, Malin R.; Ivanov, Assen B.; and Karakolev, Kolyo G., 4,462,878, Cl. 204-140.000.
Valestin, James C. Apparatus for electronically determining postage in response to weight. 4,462,473, Cl. 177-25.000.
Valley Engineering, Inc.: *See*—
Caron, Ronald L., 4,462,172, Cl. 37-231.000.
Valutec AG: *See*—
Meyer, Bruno, 4,462,604, Cl. 280-242.0WC.
Van Leer Verpackungen GmbH: *See*—
Junge, Norbert E. A.; and Kraan, Gerrit, 4,462,536, Cl. 229-5.500.
van der Linde, Robert: *See*—
Belder, Eimbert G.; van der Linde, Robert; and Schippers, Jan, 4,463,140, Cl. 525-438.000.
Van Der Puy, Michael; Gatrone, Ralph C.; Robinson, Martin A.; and Hendrickson, Larry L., to Allied Corporation. Urease inhibited urea based fertilizer compositions containing organo boron acid compounds. 4,462,819, Cl. 71-28.000.
Van Zandt, Hillard C. Hydraulic long stroke pump. 4,462,764, Cl. 417-401.000.
Varian Associates, Inc.: *See*—
Robertson, David A.; and Turner, Norman L., 4,463,255, Cl. 250-251.000.
Varshney, Ramesh C. Semiconductor structure for recessed isolation oxide. 4,462,846, Cl. 148-33.200.
Vayenas, Costas G.: *See*—
Hegedus, Louis; Vayenas, Costas G.; and Michaels, James N., 4,463,065, Cl. 429-33.000.
Veda, Inc.: *See*—
Buschbom, Floyd E.; and Henke, Donald L., 4,462,693, Cl. 366-189.000.
Veneklase, Brian J., to United States of America, Air Force. Programmable digital temperature controller apparatus. 4,463,436, Cl. 364-557.000.
Vepa AG: *See*—
Fleissner, Heinz, 4,462,226, Cl. 68-5.00D.
Vereinigte Elektrizitatswerke Westfalen AG: *See*—
Karger, Robert, 4,462,976, Cl. 423-481.000.
Verheijen, Augustinus W.: *See*—
Bassett, Peter J.; and Verheijen, Augustinus W., 4,463,215, Cl. 136-244.000.
Vernitron Corporation: *See*—
Martin, Werner, 4,462,403, Cl. 128-312.000.
Vetter, Harald: *See*—
Utner, Ferdinand; and Vetter, Harald, 4,463,338, Cl. 338-281.000.
Victor Company of Japan, Ltd.: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Sakurai, Masaki; Yusa, Yahuhiro; and Yoshihara, Kenji, 4,463,388, Cl. 358-342.000.
Viking Injector Company: *See*—
Fulmer, Frederick J.; and Moschak, George, 4,462,511, Cl. 222-52.000.
Ville, Frans J.: *See*—
Messens, Joseph L.; Ville, Frans J.; and Beels, Roland F., 4,463,316, Cl. 324-447.000.
Villiger, Alois: *See*—
Boller, Arthur; Schadt, Martin; and Villiger, Alois, 4,462,923, Cl. 252-299.610.
Virginia Plastics Company: *See*—
Bogese, Charles E., 4,462,141, Cl. 24-16.0PB.
Vivitar Corporation: *See*—
Moskovich, Jacob, 4,462,664, Cl. 350-427.000.
Orban, John M., 4,462,666, Cl. 354-126.000.
Vogler, Rudolf: *See*—
Egger, Hans R.; and Vogler, Rudolf, 4,462,719, Cl. 406-64.000.
Vogt, Hans-Joachim: *See*—
Hornung, Friedrich; Jandt, Wolfgang; Schadlich, Fritz; Vogt, Hans-Joachim; and Wunsch, Steffen, 4,463,293, Cl. 318-284.000.
Volk, Joseph A., Jr.; and Garner, David, to Beta Corporation. Microprocessor based pellet mill control. 4,463,430, Cl. 364-468.000.
Volleyball World, Inc.: *See*—
Carlson, Linda A.; and Morgan, Steven R., 4,462,115, Cl. 2-2.000.
Vollrath, Donald E., to Litton Industrial Products, Inc. Timing generator for use with multi-phase control rectifier systems. 4,463,415, Cl. 363-87.000.
von der Ohe, Manfred, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for motor vehicles. 4,462,609, Cl. 280-690.000.
Von Voigtlander, Philip F.: *See*—
Collins, Robert J.; Kaplan, Lester J.; Ludens, James H.; and Von Voigtlander, Philip F., 4,463,013, Cl. 424-274.000.
Vormals Jetter & Scheerer Aesculap-Werke Aktiengesellschaft: *See*—
Schwarz, Theodor; Freyer, Karl; and Theilmann, Manfred, 4,462,404, Cl. 128-321.000.
Vorsanger, Jean-Jacques: *See*—
Pauling, Horst; Wehrli, Christof; and Vorsanger, Jean-Jacques, 4,463,180, Cl. 548-303.000.
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Hitch, Robert J., 4,462,384, Cl. 126-41.00R.
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Duane, Robert A., 4,462,169, Cl. 34-62.000.
Hegedus, Louis; Vayenas, Costas G.; and Michaels, James N., 4,463,065, Cl. 429-33.000.
Lin, Shiow C., 4,463,128, Cl. 525-59.000.
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Waldecker, Donald E. Centrifugal, magnetic and screening separator. 4,462,907, Cl. 210-223.000.
Walker, Fred, Jr. Self indexed record album rack. 4,462,498, Cl. 211-40.000.
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Cooper, Duncan H.; and Egan, Herbert W., Jr., 4,462,270, Cl. 74-574.000.
Stone, Richard L., 4,462,618, Cl. 285-47.000.
Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Tolnic acid. 4,463,103, Cl. 502-159.000.
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Walters, Harry J.; and Gerben, Ralph D., to M. S. Willett, Inc. Feed and transfer system. 4,462,738, Cl. 414-127.000.
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Warnier, Jean M. M.: *See—*
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Warwick, Edward H.; Parker, Donald L.; and Kaup, Ralph J., to General Motors Corporation. Combined vehicle service and parking brake control mechanism. 4,462,487, Cl. 192-4.00A.
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Weis, Rudolf R.; and Schutz, Rudolph W., to Crown Zellerbach Corporation. Apparatus for culling cant ends. 4,462,287, Cl. 83-104.000.
Welden, David P. Variable stage direct field boiler. 4,462,342, Cl. 122-448.00R.
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Wenstrom, Roger A.; Irvin, Donald E.; MacKay, George L.; and Robinson, Hugh A., to William W. Holes. Process and apparatus for making a multi-pocketed album page. 4,462,854, Cl. 156-250.000.
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Wilson, James H., 4,463,314, Cl. 324-244.000.
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Gendron, Wilfred H., 4,462,538, Cl. 229-68.00R.
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Schilling, Peter; and Schreuders, Hans G., 4,462,840, Cl. 106-277.000.
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Fleck, George J., 4,462,646, Cl. 312-214.000.
Whisenant, Charles T. Wheel alignment device. 4,462,241, Cl. 72-458.000.
Whispell, Louis J. Inflatable sole construction. 4,462,171, Cl. 36-3.00B.
White, Charles A. Stamped low friction bearing, and process for making same. 4,462,144, Cl. 29-149.5DP.
Whitehouse, Ronald C. N. Rotary piston machine with mating frusto-conical sealing surface. 4,462,775, Cl. 418-107.000.
Whitley, George J., to RCA Corporation. Apparatus for securing a component to a printed circuit board. 4,462,435, Cl. 140-105.000.
Whitley, George J., to RCA Corporation. Apparatus for detecting the presence of components on a printed circuit board. 4,463,310, Cl. 324-73.0PC.
Wichman, Cynthia A., to Kendall Company, The. Surgical drape. 4,462,396, Cl. 128-132.00D.
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Wilson, Robert A.; and Peterson, J. Leroy, to Custom Equipment Corporation. Low temperature kiln. 4,462,870, Cl. 202-124.000.

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Wiltshire, Antony R., to Ford Motor Company; and Desitech Limited. Power tool marking system. 4,462,285, Cl. 81-468.000.

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Wood, Charles L., to Ball Corporation. Programmable automatic controller. 4,463,416, Cl. 364-143.000.

Wood, Dennis E., to Rando Machine Corporation. Pneumatic leveling device for fiber feeding apparatus. 4,462,140, Cl. 19-105.000.

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Wu, Tse C.; and West, James C., to Morris Township, Morris County. High molecular weight poly(vinyl acetate) and poly(vinyl alcohol) and processes for their production. 4,463,138, Cl. 526-319.000.

Wudl, Fred, to AT & T Bell Laboratories. Process for producing chalcogen containing compounds. 4,462,938, Cl. 260-550.000.

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Yamaguchi, Hiroaki: *See*—
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Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanaka, Hideaki; and Kawabata, Kohji, 4,462,999, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; and Yamanaka, Hideaki, 4,463,003, Cl. 424-246.000.

Yamanaka, Mikio: *See*—
Otoguro, Yasuo; Yamanaka, Mikio; Hashimoto, Katukuni; Sakakibara, Mizuo; and Onoyama, Masao, 4,463,061, Cl. 428-683.000.
Yamanaka, Takayuki, to Nippondenso Co., Ltd. Air-conditioning system for motor vehicle compartment and method for controlling the same. 4,462,218, Cl. 62-175.000.
Yamanoi, Masaru; and Satoh, Hiroshi, to Nippon Columbia Kabushikikaisha. Head phone. 4,463,223, Cl. 179-156.00R.
Yamauchi, Motonori: *See*—
Nakao, Shunichi; Yamauchi, Motonori; and Suzuki, Churyo, 4,462,136, Cl. 15-167.00R.
Yanagida, Kazuhiro: *See*—
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,893, Cl. 208-40.000.
Moriya, Kunihiko; Tate, Kazuhito; Muroga, Goro; and Yanagida, Kazuhiro, 4,462,894, Cl. 208-40.000.
Yanagishima, Takayuki: *See*—
Seko, Yasutoshi; and Yanagishima, Takayuki, 4,463,347, Cl. 340-576.000.
Yanda, William F.: *See*—
Holdridge, Robert B.; Taff, Douglas C.; and Yanda, William F., 4,462,390, Cl. 126-430.000.
Yang, Gwo T. Combination lock for luggage cases. 4,462,232, Cl. 70-312.000.
Yankowsky, Anthony W.; Stanhope, Harry W.; and Hicks, Darrell D., to Celanese Corporation. Process for bonding polyester reinforcement elements to rubber. 4,462,855, Cl. 156-307.300.
Yao, Shi-Kay: *See*—
Asawa, Charles K.; Barnoski, Michael K.; and Yao, Shi-Kay, 4,463,254, Cl. 250-231.00R.
Yarwood, John C.: *See*—
Kindlmann, Peter J.; Yarwood, John C.; Ungarean, Gary L.; and Tyler, Derek E., 4,462,457, Cl. 164-503.000.
Yashima, Hiroyuki, to Olympus Optical Co., Ltd. Pump drive circuit. 4,463,269, Cl. 307-129.000.
Yasui, Toshihiro; and Warnke, Wayne L., to Yamaha Hatsudoki Kabushiki Kaishi. Snowmobile rear suspension unit. 4,462,480, Cl. 180-193.000.
Yazaki, Takashi: *See*—
Koyama, Masayasu; Yazaki, Takashi; and Tanikawa, Isao, 4,463,116, Cl. 524-232.000.
Yeazell, Bruce A.: *See*—
Dirksing, Robert S.; and Yeazell, Bruce A., 4,462,121, Cl. 4-228.000.
Yngstrom, Sven A.: *See*—
Norman, Erik B.; and Yngstrom, Sven A., 4,462,164, Cl. 33-355.00R.
Yokoyama, Shoji: *See*—
Miki, Nobuaki; and Yokoyama, Shoji, 4,462,277, Cl. 74-867.000.
Yoneyama, Tsukasa, to Seki & Company, Ltd. Dielectric waveguide. 4,463,330, Cl. 333-239.000.
Yoneyoshi, Yukio: *See*—
Suzukamo, Gohfu; Fukao, Masami; and Yoneyoshi, Yukio, 4,463,188, Cl. 562-506.000.
Yonezawa, Toshio: *See*—
Abe, Masahiro; Yonezawa, Toshio; Aoyama, Masaharu; and Ajima, Takashi, 4,462,856, Cl. 156-345.000.
Yorkvest Limited: *See*—
Markson, Morley, 4,462,636, Cl. 297-439.000.
Yoshida Kogyo K.K.: *See*—
Morita, Toyoo, 4,462,154, Cl. 29-767.000.
Yoshida, Satoshi: *See*—
Inaba, Nobukatsu; and Yoshida, Satoshi, 4,462,906, Cl. 210-222.000.
Yoshida, Tsutomu: *See*—
Harada, Takahiro; Miyagawa, Eiji; Umemoto, Junko; Yoshida, Tsutomu; and Hamakado, Toshinari, 4,463,091, Cl. 435-68.000.
Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Sakurai, Masaki; Yusa, Yahuhiro; and Yoshihara, Kenji, 4,463,388, Cl. 358-342.000.
Yoshii, Takashi; Horii, Yasuyuki; and Tama, Tomeaki, to Kubota, Ltd. Change-speed apparatus for a tractor. 4,462,273, Cl. 74-745.000.
Yoshikawa, Yukio: *See*—
Kurosu, Tomio; and Yoshikawa, Yukio, 4,462,672, Cl. 354-435.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Saito, Tadao; Kishi, Takao; and Kakuta, Yoshiyuki, 4,462,549, Cl. 239-333.000.
Young, Charles A.; Geelhood, Bruce D.; and Silva, Dennis M., to United States of America, Navy. Lightweight neutron detector. 4,463,264, Cl. 250-390.000.
Young, James: *See*—
Johnson, Peter E.; and Young, James, 4,462,745, Cl. 414-330.000.
Young, John A. I., to General Electric Company. Wheel slip control using differential signal. 4,463,289, Cl. 318-52.000.
Young, Jon W., Jr.: *See*—
Dinsmore, Harold L.; and Young, Jon W., Jr., 4,462,811, Cl. 55-18.000.
Yung, Tak-Yim; and Citrin, David, to United Agencies Limited. Electronic watches. 4,462,696, Cl. 368-84.000.
Yusa, Yahuhiro: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Sakurai, Masaki; Yusa, Yahuhiro; and Yoshihara, Kenji, 4,463,388, Cl. 358-342.000.
Zabec, Glenn M.: *See*—
Penney, C. Bradford; Zabec, Glenn M.; and Sridharan, Sri P., 4,463,283, Cl. 315-87.000.
Zabel, Herbert E., to American Home Products Corporation. Padlock. 4,462,231, Cl. 70-21.000.
Zabel, John H., Jr. Valve core for pneumatic tires. 4,462,449, Cl. 152-429.000.
Zahir, Abdul-Cader: *See*—
Diethelm, Hermann; and Zahir, Abdul-Cader, 4,463,147, Cl. 526-262.000.
Zahnraderfabrik Renk A.G.: *See*—
Reppert, Rudi; and Zaunberger, Franz X., 4,462,274, Cl. 74-781.00R.
Zahnradfabrik Friedrichshafen, AG.: *See*—
Lang, Armin, 4,462,478, Cl. 180-143.000.
Zalar, Frank E.: *See*—
Kosmatka, Walter J.; and Zalar, Frank E., 4,463,278, Cl. 313-318.000.
Zane, Ronald O.: *See*—
Sterner, Mark H.; and Zane, Ronald O., 4,463,022, Cl. 426-262.000.
Zanzonico, Rocco. Latch dead-bolting means. 4,462,624, Cl. 292-258.000.
Zarling, Emil W.: *See*—
Snowdon, Albert C.; Forsell, Kenneth A.; Theisen, Peter J.; Zarling, Emil W.; and Porter, David G., 4,462,657, Cl. 339-256.00S.
Zatezalo, John M.; and Spalla, Lucian J., to Industrial Maintenance Systems, Inc. Shaft alignment calculator. 4,463,438, Cl. 364-715.000.
Zaunberger, Franz X.: *See*—
Reppert, Rudi; and Zaunberger, Franz X., 4,462,274, Cl. 74-781.00R.
Zeidler, Ulrich: *See*—
Moller, Hinrich; Hase, Brigitte; Konrad, Gunther; Wilk, Hans-Christoph; and Zeidler, Ulrich, 4,463,006, Cl. 424-251.000.
Zemke, Edward H.: *See*—
Guenther, Kenneth L.; Zemke, Edward H.; and Warden, Gerald D., 4,462,428, Cl. 137-868.000.
Zenith Electronics Corporation: *See*—
Fritsch, Kenneth L.; Jordan, William A.; and Lopez, Hugo A., 4,463,075, Cl. 430-23.000.
Ziegler, John A.: *See*—
Hotine, William; and Ziegler, John A., 4,462,774, Cl. 418-61.00B.
Zils, James A., to Russell, Burdsall & Ward Corporation. Bolt holding wrench. 4,462,281, Cl. 81-56.000.
Zimmerman, Robert L., to Texaco Inc. Polyurethane catalyst system additive which permits the use of relatively "cold" molds. 4,463,050, Cl. 428-318.800.
Zollner, Christine: *See*—
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,887, Cl. 204-286.000.
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,888, Cl. 204-286.000.
Zollner, Dieter H.: *See*—
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,887, Cl. 204-286.000.
Koziol, Konrad; Pilbrow, Malcolm F.; Zollner, Christine; and Zollner, Dieter H., 4,462,888, Cl. 204-286.000.
Zurcher, Allen K.; and McFarland, Wayne F. Method for mining and reclaiming land. 4,462,713, Cl. 405-36.000.
Zweifel, Hans; Berger, Joseph; and Boshard, Hans, to Ciba-Geigy Corporation. Photocrosslinkable polymers with side groups derived from indenone and the preparation and use of these polymers. 4,463,142, Cl. 525-502.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF JULY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Chisum, Finis L. Auto body and frame straightening device. Re. 31,636, Cl. 72-305.000.

Lam, Tat C., to TCL, Inc. Wideband transceiver with EMI suppression. Re. 31,638, Cl. 375-7.000.

Nicholson, Victor. Bidirectional unicable switching system. Re. 31,639, Cl. 455-4.000.

Sanyo Electric Co., Ltd.: *See*—
Yoshida, Nagatoshi; and Taga, Yoshihito, Re. 31,637, Cl. 219-10.55R.

Taga, Yoshihito: *See*—
Yoshida, Nagatoshi; and Taga, Yoshihito, Re. 31,637, Cl. 219-10.55R.

TCL, Inc.: *See*—
Lam, Tat C., Re. 31,638, Cl. 375-7.000.

Yoshida, Nagatoshi; and Taga, Yoshihito, to Sanyo Electric Co., Ltd. Combination microwave and gas oven. Re. 31,637, Cl. 219-10.55R.

LIST OF DESIGN PATENTEES

AB Robacks Mekaniska: *See*—
Bostrom, Sture, 274,937, Cl. D25-3.000.
Bostrom, Sture, 274,938, Cl. D25-3.000.
Bostrom, Sture, 274,939, Cl. D25-3.000.
Bostrom, Sture, 274,940, Cl. D25-3.000.
Bostrom, Sture, 274,941, Cl. D25-3.000.
Bostrom, Sture, 274,942, Cl. D25-3.000.
Bostrom, Sture, 274,943, Cl. D25-3.000.

Allway Tools, Inc.: *See*—
Gringer, Donald, 274,952, Cl. D32-48.000.
Gringer, Donald, 274,953, Cl. D32-48.000.

Amco Corporation: *See*—
Bentson, Wade, 274,880, Cl. D7-409.000.

Amesbury Industries, Inc.: *See*—
Esty, Steven R., 274,946, Cl. D25-73.000.

Aoki, Yoshihiro, to Application Art Laboratories Co., Ltd. Separable magnetic lock for a purse or similar article. 274,883, 7-31-84, Cl. D8-331.000.

Application Art Laboratories Co., Ltd.: *See*—
Aoki, Yoshihiro, 274,883, Cl. D8-331.000.

Aronowitz, Robert J.; and Katzanek, Bernard D., to Samsonite Corporation. Chair. 274,869, 7-31-84, Cl. D6-366.000.

B. F. Goodrich Company, The: *See*—
Skerl, Richard J., 274,897, Cl. D12-147.000.

Ballone, Michael P.: *See*—
Szostak, Jan; La Police, George; Brown, John; and Ballone, Michael P., 274,910, Cl. D15-69.000.

Bandiera, Enzo, to Velamp S.p.A. Flashlight. 274,949, 7-31-84, Cl. D26-49.000.

Basaldua, Tim, Jr. Drawing implement holder for mounting on a drawing table. 274,919, 7-31-84, Cl. D19-75.000.

Bayerische Motoren Werke A.G.: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 274,901, Cl. D12-176.000.

Bentson, Wade, to Amco Corporation. Holder for an artichoke or similar vegetable. 274,880, 7-31-84, Cl. D7-409.000.

Bladen, Roy V., to Hough Industries Limited. Belt mounted pocket for a tool holder. 274,860, 7-31-84, Cl. D2-400.000.

Boling Company, The: *See*—
Lopez-Benitez, Carlos L., 274,868, Cl. D6-366.000.

Boling, James W.: *See*—
Wilbert, Kenneth P.; Freymuth, William P.; Shelton, Kyle R.; and Boling, James W., 274,890, Cl. D10-46.000.

Boltz, Charles D.: *See*—
Rainey, James H.; and Boltz, Charles D., 274,905, Cl. D14-1.000.

Bonfield, Charles S. Chain link for finger joint machine or similar apparatus. 274,913, 7-31-84, Cl. D15-138.000.

Bonney, Warren J., to Warner-Lambert Co. Clot detection apparatus. 274,936, 7-31-84, Cl. D24-17.000.

Bostrom, Sture, to AB Robacks Mekaniska. Concrete supply station. 274,937, 7-31-84, Cl. D25-3.000.

Bostrom, Sture, to AB Robacks Mekaniska. Concrete supply station. 274,938, 7-31-84, Cl. D25-3.000.

Bostrom, Sture, to AB Robacks Mekaniska. Concrete supply station. 274,939, 7-31-84, Cl. D25-3.000.

Bostrom, Sture, to AB Robacks Mekaniska. Concrete supply station. 274,940, 7-31-84, Cl. D25-3.000.

Bostrom, Sture, to AB Robacks Mekaniska. Concrete supply station. 274,941, 7-31-84, Cl. D25-3.000.

Bostrom, Sture, to AB Robacks Mekaniska. Concrete supply station. 274,942, 7-31-84, Cl. D25-3.000.

Bostrom, Sture, to AB Robacks Mekaniska. Concrete supply station. 274,943, 7-31-84, Cl. D25-3.000.

Bouman, Mark H., to Century Mfg. Co. Portable welding machine. 274,914, 7-31-84, Cl. D15-144.000.

Braun, Hans: *See*—
Luthe, Claus; Rennen, Manfred; and Braun, Hans, 274,901, Cl. D12-176.000.

Brown, John: *See*—
Szostak, Jan; La Police, George; Brown, John; and Ballone, Michael P., 274,910, Cl. D15-69.000.

Brussing, Bernd: *See*—
Zeischegg, Walter; and Brussing, Bernd, 274,950, Cl. D27-29.000.

Caldwell, John W., to Pacific Furniture Mfg. Co. Seat. 274,867, 7-31-84, Cl. D6-360.000.

Canter, Richard S. Bag attachable to bicycles or the like. 274,900, 7-31-84, Cl. D12-158.000.

Capezzuto, John P., to Dennison Manufacturing Company. Squeeze bottle for liquids. 274,886, 7-31-84, Cl. D9-353.000.

Casa Bella Imports, Inc.: *See*—
Matthias, Jan H., 274,871, Cl. D6-372.000.

Century Mfg. Co.: *See*—
Bouman, Mark H., 274,914, Cl. D15-144.000.

Child, Francis W. Firearm chamber plug. 274,927, 7-31-84, Cl. D22-7.000.

Claman, Mike T. Loveseat. 274,870, 7-31-84, Cl. D6-369.000.

Claxton, Bruce A.: *See*—
Eckmann, John A.; and Claxton, Bruce A., 274,903, Cl. D13-5.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 274,921, Cl. D21-111.000.

Cooper Group Deutschland GmbH, The: *See*—
Rittmann, Gunther, 274,882, Cl. D8-30.000.

Cope, Raymond; and King, Michael. Computer key-punch table. 274,873, 7-31-84, Cl. D6-420.000.

Coppa, Ciro C. Decorative screen door. 274,944, 7-31-84, Cl. D25-48.000.

Correa, Alvaro: *See*—
Houlihan, John T.; and Correa, Alvaro, 274,894, Cl. D10-92.000.

Cox, Merle C.: *See*—
Fallon, Edward G.; and Cox, Merle C., 274,892, Cl. D10-79.000.
Fallon, Edward G.; and Cox, Merle C., 274,893, Cl. D10-78.000.

Culpepper, Bertram C., Jr.; and Wilson, Richard C. Single backer board support for siding. 274,947, 7-31-84, Cl. D25-73.000.

Cummings, Kenneth W.: *See*—
Perethian, Charles M.; Cummings, Kenneth W.; and Posson, Steven J., 274,899, Cl. D12-158.000.

D. Swarovski & Co.: *See*—
Schwab, Kurt, 274,895, Cl. D10-109.000.

Davis, Stephen H.; and Stephens, Randy R., to Water Refining Company, Inc. Combined water treatment and storage unit. 274,929, 7-31-84, Cl. D23-3.000.

Deb Chemical Proprietaries Limited: *See*—
Ryder, Geoffrey A., 274,887, Cl. D9-370.000.

Dennison Manufacturing Company: *See*—
Capezzuto, John P., 274,886, Cl. D9-353.000.

Diffrient, Niels, to Hauserman Inc. Int. Furniture & Textile Div. Chair. 274,864, 7-31-84, Cl. D6-366.000.

Eckmann, John A.; and Claxton, Bruce A., to Motorola Inc. Battery charging unit or similar article. 274,903, 7-31-84, Cl. D13-5.000.

Emery, Willie B. Table. 274,874, 7-31-84, Cl. D6-484.000.

English, Gary F.; and Wiley, Donald E., to Foseco Trading A.G. Refractory tube. 274,912, 7-31-84, Cl. D15-136.000.

Esterline Angus Instrument Corp.: *See*—
Fallon, Edward G.; and Cox, Merle C., 274,892, Cl. D10-79.000.
Fallon, Edward G.; and Cox, Merle C., 274,893, Cl. D10-78.000.

Esty, Steven R., to Amesbury Industries, Inc. Weatherseal assembly for double hung and sliding windows. 274,946, 7-31-84, Cl. D25-73.000.
Fallon, Edward G.; and Cox, Merle C., to Esterline Angus Instrument Corp. Electrical sensing and measuring instrument. 274,892, 7-31-84, Cl. D10-79.000.
Fallon, Edward G.; and Cox, Merle C., to Esterline Angus Instrument Corp. Electrical measuring instrument. 274,893, 7-31-84, Cl. D10-78.000.
Ferguson, Arthur R.; and Stevens, Myron T., to Outboard Marine Corporation. Mounting bracket assembly for an outboard motor. 274,908, 7-31-84, Cl. D15-4.000.
Ferguson, Arthur R.; and Stevens, Myron T., to Outboard Marine Corporation. Outboard motor. 274,909, 7-31-84, Cl. D15-4.000.
Fildan, Gerhard. Strap fastener for foundation garments. 274,862, 7-31-84, Cl. D2-414.000.
First Champaign Corporation: *See*—
Perethian, Charles M.; Cummings, Kenneth W.; and Posson, Steven J., 274,899, Cl. D12-158.000.
Fitch, Jack H. Mobile support for scaffolding or the like. 274,945, 7-31-84, Cl. D25-68.000.
Foseco Trading A.G.: *See*—
English, Gary F.; and Wiley, Donald E., 274,912, Cl. D15-136.000.
Freitag, Wolfgang. Cable drum. 274,884, 7-31-84, Cl. D8-359.000.
Freymuth, William P.: *See*—
Wilbert, Kenneth P.; Freymuth, William P.; Shelton, Kyle R.; and Boling, James W., 274,890, Cl. D10-46.000.
General Design, Inc.: *See*—
Wilbert, Kenneth P.; Freymuth, William P.; Shelton, Kyle R.; and Boling, James W., 274,890, Cl. D10-46.000.
Giragosian, Paul S. Firearm. 274,926, 7-31-84, Cl. D22-1.000.
Goodwin, Gilbert A. Dust-free ash remover. 274,932, 7-31-84, Cl. D23-131.000.
Gringer, Donald, to Allway Tools, Inc. Hand scraper. 274,952, 7-31-84, Cl. D32-48.000.
Gringer, Donald, to Allway Tools, Inc. Hand scraper. 274,953, 7-31-84, Cl. D32-48.000.
Hagland, Kerstin M.: *See*—
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V., 274,863, Cl. D6-333.000.
Hanses, Ulf M.: *See*—
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V., 274,863, Cl. D6-333.000.
Harris, Linda A.; and Ross, Christopher S., to Ross and Harris, Inc. Lollipop. 274,859, 7-31-84, Cl. D1-18.000.
Hasbro Industries, Inc.: *See*—
Radosevich, Roseann; and O'Connell, David V., 274,924, Cl. D21-167.000.
Hauserman Inc. Int. Furniture & Textile Div.: *See*—
Diffrient, Niels, 274,864, Cl. D6-366.000.
Hechter, Daniel. Fountain pen. 274,917, 7-31-84, Cl. D19-51.000.
Holcomb, Donald E. Manual exerciser. 274,925, 7-31-84, Cl. D21-198.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ito, Ketaro, 274,902, Cl. D12-211.000.
Hough Industries Limited: *See*—
Bladen, Roy V., 274,860, Cl. D2-400.000.
Houlihan, John T.; and Correa, Alvaro, to Timex Medical Products Corporation. Digital weight scale. 274,894, 7-31-84, Cl. D10-92.000.
Hunt, Waldo H., to Intervisual Communications, Inc. House book. 274,916, 7-31-84, Cl. D19-28.000.
Ikeda, Seito. Toy bear football player. 274,923, 7-31-84, Cl. D21-159.000.
Intervisual Communications, Inc.: *See*—
Hunt, Waldo H., 274,916, Cl. D19-28.000.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, 274,921, Cl. D21-111.000.
Ito, Ketaro, to Honda Giken Kogyo Kabushiki Kaisha. Motor cycle wheel. 274,902, 7-31-84, Cl. D12-211.000.
Joe, Marcon. Water filter unit. 274,930, 7-31-84, Cl. D23-4.000.
Johnson, Edwin F. Combined control panel and range hood for recreational vehicles. 274,934, 7-31-84, Cl. D23-151.000.
Joice, Joe; and Pardo, John, to Olin Corporation. Packaging container for ammunition. 274,885, 7-31-84, Cl. D9-341.000.
Kates, Fred W., to Revlon, Inc. Display stand. 274,875, 7-31-84, Cl. D6-464.000.
Kates, Fred W., to Revlon, Inc. Top frame for a display case. 274,878, 7-31-84, Cl. D6-511.000.
Kates, Fred W., to Revlon, Inc. Bottom frame for a display case. 274,879, 7-31-84, Cl. D6-495.000.
Katzanek, Bernard D.: *See*—
Aronowitz, Robert J.; and Katzanek, Bernard D., 274,869, Cl. D6-366.000.
Kawanabe, Masahiro; Matsumoto, Yasuhiko; and Umehara, Nobuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Television receiver. 274,906, 7-31-84, Cl. D14-81.000.
Keil, O'Dell M.; and Kozell, Eugene J., to Litton Systems, Inc. Weapon sight. 274,915, 7-31-84, Cl. D16-133.000.
King, Michael: *See*—
Cope, Raymond; and King, Michael, 274,873, Cl. D6-420.000.
Kotler, Dan: *See*—
Swanson, Larry B.; and Kotler, Dan, 274,948, Cl. D25-91.000.
Kozell, Eugene J.: *See*—
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Koziatek, Jerome P.: *See*—
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 274,876, Cl. D6-508.000.
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 274,877, Cl. D6-507.000.
Lang, Milan, to Les Promotions Atlantiques, Inc. Bottle. 274,888, 7-31-84, Cl. D9-381.000.
La Police, George: *See*—
Szostak, Jan; La Police, George; Brown, John; and Ballone, Michael P., 274,910, Cl. D15-69.000.
Legerius, Bengt E.; and Siebert, Hans W., to Telefonaktiebolaget L M Ericsson. Mounting ring for prefabricated fire wall lead-in. 274,904, 7-31-84, Cl. D13-13.000.
Lendvay, Joseph G.: *See*—
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 274,876, Cl. D6-508.000.
Mower, Henry W.; Seymour, Allen; Koziatek, Jerome P.; and Lendvay, Joseph G., 274,877, Cl. D6-507.000.
Les Promotions Atlantiques, Inc.: *See*—
Lang, Milan, 274,888, Cl. D9-381.000.
Lindblad, Oskar L., to Linvent AB. Cam buckle. 274,861, 7-31-84, Cl. D2-408.000.
Lindgren, Erik V.: *See*—
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V., 274,863, Cl. D6-333.000.
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V. Child's automobile seat. 274,863, 7-31-84, Cl. D6-333.000.
Linvent AB: *See*—
Lindblad, Oskar L., 274,861, Cl. D2-408.000.
Litton Systems, Inc.: *See*—
Keil, O'Dell M.; and Kozell, Eugene J., 274,915, Cl. D16-133.000.
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ISSUED JULY 31, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

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39.182	4,462,206
204	4,462,207
286	4,462,208
384	4,462,209
444	4,462,210
501	4,462,211
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	4,462,814
45	4,462,214
78	4,462,215
80	4,462,216
133	4,462,217
175	4,462,218
196.1	4,462,219
201	4,462,220
381	4,462,221
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530	4,462,224

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428	4,462,233

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67	4,462,820
99	4,462,821

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103	4,462,235
242	4,462,236
305	Re.31,636
324	4,462,237
358	4,462,238
359	4,462,239
391	4,462,240
458	4,462,241
467	4,462,242
481	4,462,243

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1 G	4,462,244
7	4,462,245
23	4,462,246
35	4,462,247
38	4,462,248
40.5 A	4,462,249
73	4,462,250
118	4,462,251
379	4,462,252
487	4,462,253
510	4,462,254
633	4,462,255
642	4,462,256
644	4,462,257
706	4,462,258
749	4,462,259
799	4,462,260
861.02	4,462,261
861.05	4,462,262
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861.77	4,462,263
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489	4,462,267
519	4,462,268
572	4,462,269
574	4,462,270
711	4,462,271
	4,462,272
745	4,462,273
781 R	4,462,274
866	4,462,275
	4,462,276
867	4,462,277
868	4,462,278
	4,462,279
	4,462,280

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58	4,462,823
60	4,462,824
	4,462,825
121 B	4,462,826
229	4,463,058

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57.11	4,462,282
57.37	4,462,283
428 R	4,462,284
468	4,462,285

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311	4,462,290
368	4,462,291
471.2	4,462,292
855	4,462,293

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1.16	4,462,295
422 S	4,462,296
484	4,462,297

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19	4,462,298

CLASS 89

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CLASS 91

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CLASS 92

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248	4,462,302

CLASS 98

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40 V	4,462,304
78	4,462,305

CLASS 99

340	4,462,306
386	4,462,307
413	4,462,308
575	4,462,309

CLASS 100

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CLASS 101

143	4,462,311

CLASS 102

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CLASS 104

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115	4,462,314
172 S	4,462,315

CLASS 105

151	4,462,316

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1.19	4,462,827
3	4,462,828
14.05	4,462,829
14.14	4,462,830
18.26	4,462,831
23	4,462,832
	4,462,833
38.28	4,462,834
75	4,462,835
92	4,462,836
93	4,462,837
139	4,462,838
198	4,462,839
277	4,462,840

CLASS 109

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CLASS 110

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	4,462,319

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104	4,462,320
121.15	4,462,321
141	4,462,322
239	4,462,323
279	4,462,324
315	4,462,325
318	4,462,326

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90	4,462,327
222	4,462,328
230	4,462,329
244	4,462,330
345	4,462,331

CLASS 118

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723	4,462,333

CLASS 119

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	4,462,335
20	4,462,336
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53.5	4,462,338

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7 R	4,462,339
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448 R	4,462,342

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90.55	4,462,364
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196 CP	4,462,350
198 DB	4,462,352
198 F	4,462,351
	4,462,353
255	4,462,354
325	4,462,355
335	4,462,356
336	4,462,357
337	4,462,358
339	4,462,359
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357	4,462,361
425	4,462,362
427	4,462,363
438	4,462,365
440	4,462,366
442	4,462,367
446	4,462,368
450	4,462,369
	4,462,370
	4,462,371
452	4,462,372
489	4,462,373
	4,462,374
491	4,462,375
569	4,462,379
571	4,462,376
	4,462,377
	4,462,378
620	4,462,380

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15	4,462,382

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112	4,462,385
247	4,462,386
299 R	4,462,387
390	4,462,388
415	4,462,389
430	4,462,390
432	4,462,391
439	4,462,392

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92 C	4,462,394
132 D	4,462,396
200.14	4,462,397
	4,462,398
201.25	4,462,399
207.16	4,462,400
303 R	4,462,401
	4,462,402
312	4,462,403
321	4,462,404
329 R	4,462,405
419 PG	4,462,406
	4,462,407
660	4,462,408
675	4,462,409
727	4,462,410
746	4,462,411
804	4,462,412

CLASS 132

113	4,462,413

CLASS 133

5 B	4,462,414

CLASS 134

104	4,462,416
111	4,462,415

CLASS 136

208	4,463,214
244	4,463,215
256	4,463,216

CLASS 137

39	4,462,417
106	4,462,418
340	4,462,419
488	4,462,420
542	4,462,421
557	4,462,422
561 A	4,462,423
613	4,462,424
624.18	4,462,425
625.63	4,462,426
625.64	4,462,427
868	4,462,428
891	4,462,429

CLASS 138

89	4,462,430

CLASS 139

13 R	4,462,431
33	4,462,432
358	4,462,433
452	4,462,434

CLASS 140

105	4,462,435

CLASS 141

250	4,462,436
360	4,462,437

CLASS 144

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34 R	4,462,439
144.5 R	4,462,440
193 D	4,462,441
213	4,462,442
242 R	4,462,443

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33.2	4,462,846
174	4,462,847
431	4,462,841

CLASS 149

19.92	4,462,848

CLASS 150

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CLASS 152

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353 C	4,462,447
354 R	4,462,448
429	4,462,449

CLASS 156

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110.1	4,462,850
212	4,462,851
231	4,462,852
238	4,462,853
250	4,462,854
307.3	4,462,855
345	4,462,856
361	4,462,857
506	4,462,858
626	4,462,860
640	4,462,861
643	4,462,862
	4,462,863

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CLASS 160
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56 4,462,864
72 4,462,865
103 4,462,866
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280 4,462,868
CLASS 164
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133 4,462,454
340 4,462,455
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503 4,462,457
504 4,462,458
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4,462,461
54 4,462,459
80 C 4,462,462
140 4,462,463
CLASS 166
68.5 4,462,464
117.5 4,462,465
280 4,462,466
CLASS 173
105 4,462,467
121 4,462,468
CLASS 174
52 FP 4,463,217
68.5 4,463,218
127 4,463,219
CLASS 175
40 4,462,469
72 4,462,470
296 4,462,471
320 4,462,472
343 4,462,220
CLASS 177
25 4,462,473
48 4,462,474
173 4,462,475
CLASS 179
2 EB 4,463,221
121 D 4,463,222
156 R 4,463,223
CLASS 180
8.6 4,462,476
24.02 4,462,477
143 4,462,478
171 4,462,479
193 4,462,480
215 4,462,481
230 4,462,482
CLASS 181
142 4,462,483
CLASS 182
19 4,462,484
84 4,462,485
91 4,462,486
CLASS 192
0.076 4,462,490
3.29 4,462,492
4 A 4,462,487
5 4,462,488
53 E 4,462,489
84 R 4,462,491
CLASS 193
35 R 4,462,493
CLASS 194
1 N 4,462,512
100 A 4,462,513
CLASS 198
334 4,462,514
426 4,462,515
427 4,462,516
451 4,462,517
479 4,462,518
490 4,462,519
525 4,462,520
621 4,462,521
766 4,462,522
810 4,462,523
845 4,462,524
CLASS 200
19 DC 4,463,224
35 R 4,463,225
4,463,226
50 A 4,463,227
51 R 4,463,228
82 B 4,463,229
147 R 4,463,230
153 J 4,463,231
159 A 4,463,233
159 B 4,463,232
4,463,234
175 4,463,235
295 4,463,236
340 4,463,237
CLASS 201
40 4,462,869
CLASS 202
124 4,462,870
CLASS 204
1 T 4,462,871
4,462,872
4 4,462,873
52 R 4,462,874
56 R 4,462,875
59 R 4,462,876
98 4,462,877
140 4,462,878
4,462,879
161 4,462,880
192 C 4,462,883
4,462,884
192 E 4,462,882
192 EC 4,462,881
243 M 4,462,885
284 4,462,886
286 4,462,887
4,462,888
292 4,462,889
425 4,462,890
427 4,462,891
CLASS 206
150 4,462,494
CLASS 208
11 LE 4,462,892
40 4,462,893
4,462,894
59 4,462,895
253 4,462,896
254 H 4,462,897
CLASS 209
3.3 4,463,495
166 4,462,898
211 4,462,899
234 4,462,901
243 4,462,900
643 4,462,496
CLASS 210
107 4,462,902
150 4,462,903
177 4,462,904
189 4,462,905
222 4,462,906
223 4,462,907
237 4,462,908
325 4,462,909
610 4,462,910
638 4,462,911
665 4,462,912
708 4,462,913
755 4,462,914
765 4,462,915
798 4,462,916
CLASS 211
7 4,462,497
40 4,462,498
41 4,462,499
151 4,462,500
CLASS 215
296 4,462,501
329 4,462,502
CLASS 219
10.55 B 4,463,238
10.55 F 4,463,239
10.55 R Re.31,637
69 G 4,463,240
69 V 4,463,242
69 W 4,463,241
74 4,463,243
110 4,463,244
121 PM 4,463,245
216 4,463,246
236 4,463,247
284 4,463,248
441 4,463,249
CLASS 220
90.2 4,462,503
214 4,462,504
266 4,462,505
CLASS 221
13 4,462,506
63 4,462,507
201 4,462,508
259 4,462,509
CLASS 222
48 4,462,510
52 4,462,511
CLASS 224
210 4,462,525
CLASS 225
4 4,462,526
CLASS 226
15 4,462,527
120 4,462,528
125 4,462,529
156 4,462,530
171 4,462,531
CLASS 228
40 4,462,532
119 4,462,533
180 A 4,462,534
184 4,462,535
CLASS 229
5.5 4,462,536
45 EC 4,462,537
68 R 4,462,538
CLASS 235
385 4,463,250
470 4,463,251
CLASS 236
13 4,462,539
47 4,462,540
CLASS 237
2 A 4,462,541
19 4,462,542
CLASS 239
8 4,462,543
33 4,462,544
97 4,462,545
4,462,546
130 4,462,547
225 4,462,548
333 4,462,549
655 4,462,550
CLASS 242
7.19 4,462,551
42 4,462,552
55.19 A 4,462,553
107.2 4,462,554
118.31 4,462,556
118.6 4,462,555
150 M 4,462,557
178 4,462,558
CLASS 244
17.19 4,462,559
63 4,462,560
118.5 4,462,561
122 A 4,462,562
122 AG 4,462,563
CLASS 248
27.1 4,462,564
51 4,462,565
CLASS 250
213 VT 4,463,252
4,463,253
251 R 4,463,254
251 4,463,255
256 4,463,256
310 4,463,257
334 4,463,258
338 4,463,259
339 4,463,260
4,463,261
349 4,463,262
363 R 4,463,263
390 4,463,264
492.2 4,463,265
505.1 4,463,266
CLASS 251
30 4,462,566
297 4,462,567
335 A 4,462,568
CLASS 252
8.55 R 4,462,917
32.7 E 4,462,918
62.54 4,462,919
75 4,462,920
78.3 4,462,921
174.12 4,462,922
299.61 4,462,923
299.63 4,462,924
301.28 4,462,925
315.1 4,462,926
350 4,462,927
373 4,462,928
518 4,462,929
519 4,462,930
700 4,462,931
CLASS 254
8 B 4,462,569
268 4,462,570
270 4,462,571
CLASS 256
52 4,462,572
65 4,462,573
CLASS 260
112 R 4,462,939
4,462,940
112.5 R 4,462,941
4,462,942
4,462,943
119 4,462,932
239 BD 4,462,933
239.1 4,462,934
429.7 4,462,935
4,462,936
544 F 4,462,937
550 4,462,938
CLASS 261
18 A 4,462,944
50 R 4,462,945
CLASS 264
23 4,462,946
54 4,462,947
140 4,462,948
261 4,462,949
292 4,462,950
334 4,462,951
509 4,462,952
564 4,462,953
CLASS 266
45 4,462,574
158 4,462,575
220 4,462,576
250 4,462,577
CLASS 267
9 C 4,462,578
CLASS 269
61 4,462,579
73 4,462,580
283 4,462,581
CLASS 270
31 4,462,582
4,462,583
4,462,584
CLASS 271
11 4,462,585
94 4,462,586
263 4,462,587
265 4,462,588
CLASS 273
60 R 4,462,589
65 E 4,462,590
73 D 4,462,591
4,462,592
84 R 4,462,593
85 G 4,462,594
164 4,462,595
239 4,462,596
296 4,462,597
378 4,462,598
411 4,462,599
CLASS 277
25 4,462,600
27 4,462,601
139 4,462,602
230 4,462,603
235 B 4,462,615
CLASS 280
242 WC 4,462,604
4,462,605
278 4,462,606
644 4,462,607
668 4,462,608
690 4,462,609
707 4,462,610
759 4,462,611
766.1 4,462,612
804 4,462,613
CLASS 281
42 4,462,614
CLASS 285
14 4,462,617
47 4,462,618
94 4,462,619
162 4,462,620
282 4,462,621
323 4,462,622
CLASS 290
40 R 4,463,267
CLASS 292
175 4,462,623
258 4,462,624
259 R 4,462,625
CLASS 294
81 SF 4,462,627
114 4,462,626
CLASS 296
1 S 4,463,628
30 4,462,629
37.9 4,462,630
160 4,462,631
187 4,462,632
188 4,462,633
CLASS 297
201 4,462,634
284 4,462,635
439 4,462,636
CLASS 299
32 4,462,637
86 4,462,638
CLASS 301
37 P 4,462,640
37 SC 4,462,639
CLASS 303
24 C 4,462,641
119 4,462,642
CLASS 307
106 4,463,268
129 4,463,269
296 R 4,463,270
350 4,463,271
358 4,463,272
450 4,463,273
491 4,463,274
CLASS 308
202 4,462,643
207 R 4,462,644
CLASS 310
78 4,463,275
198 4,462,859
266 4,463,276
CLASS 312
214 4,462,645
4,462,646
257 SM 4,462,647
CLASS 313
25 4,463,277
318 4,463,278
386 4,463,279
504 4,463,280
623 4,463,281
CLASS 315
70 4,463,282
87 4,463,283
158 4,463,284
205 4,463,285
219 4,463,286
291 4,463,287
371 4,463,288
CLASS 318
52 4,463,289
135 4,463,290
254 4,463,291
283 4,463,292
284 4,463,293
313 4,463,294
436 4,463,295
452 4,463,296
561 4,463,297
662 4,463,298
4,463,299
687 4,463,300
696 4,463,301
754 4,463,302
776 4,463,303
790 4,463,304
CLASS 322
10 4,463,305
25 4,463,306
CLASS 323
356 4,463,307
CLASS 324
57 R 4,463,308
4,463,309
73 PC 4,463,310
142 4,463,311
174 4,463,312
243 4,463,313
244 4,463,314
382 4,463,315
447 4,463,316
CLASS 329
103 4,463,317
CLASS 330
251 4,463,318
258 4,463,319
279 4,463,320
CLASS 331
1 R 4,463,321
117 D 4,463,322
CLASS 333
1 4,463,323
26 4,463,324
127 4,463,325
128 4,463,326
194 4,463,327
222 4,463,328
239 4,463,329
4,463,330
CLASS 335
202 4,463,331
258 4,463,332
CLASS 336
115 4,463,333
192 4,463,334
CLASS 337
4 4,463,335
CLASS 338
4,463,336
22 R 4,463,337
281 4,463,338
CLASS 339
3 S 4,462,648
16 R 4,462,649
22 R 4,462,650
30 4,462,651
89 M 4,462,652
89 R 4,462,653
91 R 4,462,654
98 4,462,655
154 A 4,462,656
256 S 4,462,657
CLASS 340
64 4,463,340
310 A 4,463,341
347 AD 4,463,343
347 DD 4,463,342
4,463,344
505 4,463,345
540 4,463,346
576 4,463,347
585 4,463,348
825.01 4,463,350
825.05 4,463,352
825.32 4,463,349
825.5 4,463,351
825.54 4,463,353
870.02 4,463,354
906 4,463,339
971 4,463,355
CLASS 343
7.7 4,463,356
460 4,463,357
709 4,463,358
CLASS 346
1.1 4,463,359
76 PH 4,463,360
134 4,463,361
140 R 4,463,362
159 4,463,363
160 4,463,364
163 4,463,365
210 4,462,616
CLASS 350
96.14 4,462,658
173 4,462,659
274 4,462,660
331 R 4,462,661
413 4,462,662
4,462,663
427 4,462,664
CLASS 351
160 H 4,462,665
CLASS 354
126 4,462,666
137 4,462,667
317 4,462,668
400 4,462,669
425 4,462,670
430 4,462,671
435 4,462,672

458 4,462,673

CLASS 355

3 BE 4,462,676
3 R 4,462,674
4,462,675
4,462,677
4,462,678
14 CH 4,462,679
14 D 4,462,680
14 SH 4,462,681
15 4,462,682
77 4,462,683

CLASS 356

146 4,462,684
307 4,462,685
318 4,462,686
326 4,462,687
328 4,462,688
333 4,462,689

CLASS 357

22 4,463,366
24 4,463,367
30 4,463,368
44 4,463,369
50 4,463,370

CLASS 358

13 4,463,371
22 4,463,372
76 4,463,373
78 4,463,374
111 4,463,375
112 4,463,378
120 4,463,376
133 4,463,377
154 4,463,379
160 4,463,380
166 4,463,381
181 4,463,382
212 4,463,383
227 4,463,384
242 4,463,385
261 4,463,386
310 4,463,387
342 4,463,388
343 4,463,389

CLASS 360

10.3 4,463,390
14.2 4,463,391
30 4,463,392
74.1 4,463,393
96.5 4,463,394
105 4,463,395
4,463,396
137 4,463,397

CLASS 361

1 4,463,398
4,463,399
5 4,463,400
56 4,463,406
72 4,463,401
77 4,463,402
124 4,463,403
128 4,463,404
135 4,463,405
306 4,463,407
342 4,463,408
382 4,463,409

CLASS 362

20 4,463,410
61 4,463,411
4,463,412
401 4,463,413

CLASS 363

86 4,463,414
87 4,463,415

CLASS 364

143 4,463,416
200 4,463,417
4,463,418
4,463,419
4,463,420
4,463,421
300 4,463,422
4,463,423
4,463,424
417 4,463,425
424 4,463,426
442 4,463,427
463 4,463,428
466 4,463,429
468 4,463,430
480 4,463,431
483 4,463,432
506 4,463,433
507 4,463,434
519 4,463,435
557 4,463,436
4,463,437
715 4,463,438
784 4,463,439
900 4,463,440
4,463,441
4,463,442
4,463,443
4,463,444
4,463,445
4,463,446

CLASS 365

12 4,463,447
190 4,463,448
196 4,463,449
200 4,463,450

CLASS 366

25 4,462,690
80 4,462,691
89 4,462,692
189 4,462,693
205 4,462,694
345 4,462,695

CLASS 367

16 4,463,451
134 4,463,452
135 4,463,453
173 4,463,454

CLASS 368

84 4,462,696
282 4,462,697

CLASS 374

125 4,462,698
131 4,462,699

CLASS 375

7 Re.31,638

CLASS 376

208 4,462,954
272 4,462,955
287 4,462,956
327 4,462,957
420 4,462,958

CLASS 384

105 4,462,700

CLASS 400

3 4,462,701
58 4,462,702
110 4,462,703
120 4,462,704
121 4,462,705
124 4,462,706
225 4,462,707
304 4,462,708
314 4,462,709

CLASS 403

21 4,462,710
329 4,462,142

CLASS 404

10 4,462,711
36 4,462,712

CLASS 405

4,462,713
55 4,462,714
157 4,462,715
195 4,462,717
233 4,462,716
264 4,462,718

CLASS 406

64 4,462,719
84 4,462,720
112 4,462,721
154 4,462,722

CLASS 407

18 4,462,723
30 4,462,724
92 4,462,725

CLASS 408

76 4,462,726
220 4,462,727
241 R 4,462,728

CLASS 411

15 4,462,729
371 4,462,730
433 4,462,731

CLASS 413

8 4,462,732

CLASS 414

22 4,462,733
26 4,462,734
37 4,462,735
114 4,462,736
118 4,462,737
127 4,462,738
217 4,462,739
220 4,462,740
225 4,462,741
280 4,462,742
306 4,462,743
311 4,462,744
330 4,462,745
4,462,746
567 4,462,747
738 4,462,748
748 4,462,749

CLASS 415

54 4,462,750
89 4,462,751
219 B 4,462,752

CLASS 416

41 4,462,753
97 R 4,462,754
132 R 4,462,755
215 4,462,756
244 R 4,462,757

CLASS 417

38 4,462,758
46 4,462,759
54 4,462,760
203 4,462,761
332 4,462,762
378 4,462,763
401 4,462,764
414 4,462,765
430 4,462,766
460 4,462,767
518 4,462,768

CLASS 418

1 4,462,769
39 4,462,770
55 4,462,771
4,462,772
61 B 4,462,773
4,462,774
107 4,462,775

CLASS 420

519 4,462,960
525 4,462,959
534 4,462,961

CLASS 422

58 4,462,962
78 4,462,963
102 4,462,964
186.08 4,462,965
220 4,462,966
269 4,462,967

CLASS 423

224 4,462,968
242 4,462,969
263 4,462,970
277 4,462,971
320 4,462,972
322 4,462,973
335 4,462,974
473 4,462,975
481 4,462,976
574 R 4,462,977
584 4,462,978
613 4,462,979

CLASS 424

1.1 4,462,980
27 4,462,981
35 4,462,982
45 4,462,983
78 4,462,984
85 4,462,985
4,462,986
99 4,462,987
162 4,462,988
177 4,462,989
4,462,990
4,462,991
4,462,992
4,462,993
200 4,462,994
4,462,995
217 4,462,997
243 4,462,996
245 4,462,998
246 4,462,999
4,463,000
4,463,001
4,463,002
4,463,003
248.5 4,463,004
249 4,463,005
251 4,463,006
4,463,007
263 4,463,008
4,463,009
270 4,463,010
273 R 4,463,011
4,463,012
274 4,463,013
275 4,463,014
285 4,463,015
347 4,463,016
359 4,463,017

CLASS 425

31 4,462,776
87 4,462,777
113 4,462,778
140 4,462,779
144 4,462,780
145 4,462,781
183 4,462,782
4,462,783
223 4,462,784
387.1 4,462,785
388 4,462,786
402 4,462,787

CLASS 426

1 4,463,018
17 4,463,019
19 4,463,020
90 4,463,021
262 4,463,022
270 4,463,023
533 4,463,024
599 4,463,025
652 4,463,026
4,463,027

CLASS 427

53.1 4,463,028
209 4,463,029
216 4,463,030
217 4,463,031
222 4,463,032
255.3 4,463,033
256 4,463,034
389.9 4,463,035
4,463,036
4,463,037
407.1 4,463,038
421 4,463,039
445 4,463,040

CLASS 428

35 4,463,041
4,463,042
68 4,463,043
107 4,463,044
131 4,463,045
156 4,463,046
216 4,463,047
218 4,463,048
281 4,463,049
318.8 4,463,050
323 4,463,051
424.4 4,463,052
442 4,463,053
458 4,463,054
4,463,055
542.8 4,463,056
595 4,463,057
620 4,463,059
669 4,463,060
683 4,463,061
698 4,463,062

CLASS 429

19 4,463,063
27 4,463,064
33 4,463,065
34 4,463,066
4,463,067
4,463,068
86 4,463,069
194 4,463,070
4,463,071
4,463,072

CLASS 430

5 4,463,073
7 4,463,074
23 4,463,075
37 4,463,076
56 4,463,077
73 4,463,078
203 4,463,079
213 4,463,080
218 4,463,081
228 4,463,082
273 4,463,083
315 4,463,084
372 4,463,085
553 4,463,086
567 4,463,087
614 4,463,088
617 4,463,089

CLASS 431

8 4,462,788
126 4,462,789
264 4,462,790
345 4,462,791

CLASS 432

11 4,462,792
14 4,462,793
4,462,794
4,462,795
29 4,462,796
58 4,462,797
77 4,462,798
258

CLASS 433

7 4,462,799
19 4,462,800
60 4,462,801
72 4,462,802
88 4,462,803

CLASS 435

7 4,463,090
68 4,463,091
70 4,463,092
94 4,463,093
115 4,463,094
190 4,463,095

CLASS 436

29 4,463,096
45 4,463,097
67 4,463,098
546 4,463,099

CLASS 455

4 Re.31,639

CLASS 501

108 4,463,100

CLASS 502

74 4,463,101
127 4,463,102
159 4,463,103
213 4,463,104

CLASS 518

716 4,463,105

CLASS 521

103 4,463,106
137 4,463,107

CLASS 523

216 4,463,108
333 4,463,109
409 4,463,110
413 4,463,111

CLASS 524

109 4,463,112
117 4,463,113
157 4,463,114
188 4,463,115
232 4,463,116
260 4,463,117
264 4,463,118
269 4,463,119
274 4,463,120
291 4,463,121
322 4,463,122
4,463,123
394 4,463,124
566 4,463,125
589 4,463,126
731 4,463,127

CLASS 525

59 4,463,128
83 4,463,129
87 4,463,130
76 4,463,131
92 4,463,132
99 4,463,133
109 4,463,134
123 4,463,135
187 4,463,136
316 4,463,137
329.1 4,463,139
438 4,463,140
467 4,463,141
502 4,463,142
528 4,463,143

CLASS 526

94 4,463,144
142 4,463,145
4,463,146
262 4,463,147
264 4,463,148
279 4,463,149
292.4 4,463,150
307.5 4,463,151
4,463,152
319 4,463,138
348.1 4,463,153

CLASS 528

45 4,463,154
61 4,463,155
65 4,463,156
68 4,463,157
75 4,463,158
167 4,463,159
176 4,463,160
4,463,161
190 4,463,162
196 4,463,163
212 4,463,164
301 4,463,165
336 4,463,166
4,463,167
355 4,463,168
376 4,463,169
422 4,463,170

CLASS 536

7.1 4,463,171

CLASS 544

27 4,463,173
027 4,463,172
131 4,463,174
225 4,463,175

CLASS 546

208 4,463,176
221 4,463,177

CLASS 548

158 4,463,178
255 4,463,179
303 4,463,180
306 4,463,181

CLASS 549

264 4,463,182
311 4,463,183
470 4,463,184
471 4,463,185

CLASS 560

82 4,463,186
4,463,187

CLASS 562

462 4,463,208
506 4,463,188

CLASS 564

2 4,463,189
349 4,463,190
398 4,463,191
467 4,463,192
479 4,463,193

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D1—	18	274,839		484	274,874		73	274,891		100	274,907		159	274,923			274,939
D2—	400	274,860		495	274,879		78	274,893	D15—	4	274,908		167	274,924			274,940
	408	274,861		507	274,877		79	274,892			274,909		198	274,925			274,941
	414	274,862		508	274,876		92	274,894		69	274,910	D22—	1	274,926			274,942
D6—	333	274,863		511	274,878		109	274,895		122	274,911		7	274,927			274,943
	360	274,865	D7—	409	274,880	D12—	102	274,896		136	274,912		99	274,928		48	274,944
		274,867	D8—	29	274,881			274,898		138	274,913	D23—	3	274,929		68	274,945
	366	274,864		30	274,882		147	274,897		144	274,914		4	274,930		73	274,946
		274,866		331	274,883		158	274,899	D16—	133	274,915		97	274,931			274,947
		274,868		359	274,884			274,900	D19—	28	274,916		131	274,932			
		274,869	D9—	341	274,885		176	274,901		51	274,917		138.5	274,933		91	274,948
	369	274,870		353	274,886		211	274,902		59	274,918		151	274,934	D26—	49	274,949
	372	274,871		370	274,887	D13—	5	274,903		75	274,919		163	274,935	D27—	29	274,950
	384	274,872		381	274,888		13	274,904	D21—	106	274,920	D24—	17	274,936		42	274,951
	420	274,873		426	274,889	D14—	1	274,905		111	274,921	D25—	3	274,937	D32—	48	274,952
	464	274,875	D10—	46	274,890		81	274,906		147	274,922			274,938			274,953

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	4,462,441		4,463,300		4,462,979		4,462,555		4,462,386		4,462,665
	4,462,469		4,463,326		4,463,088		4,462,684		4,462,453		4,462,685
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